How Do We Know

How Do We Know?

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BASIC STUDIES IN SCIENCE

BOOK C

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Animals

A Forest Hunter

This hungry wildcat
is looking for food.

Down jumps the cat.
What is it after?

What has happened to
the wildcat's dinner?

The cat walks softly.
What does it see now?

Will the wildcat get its dinner this time?

Hop, goes the rabbit! The cat moves fast, too.

What will help the cat catch the rabbit?

What do you think is going to happen now?

A Garden Trapper

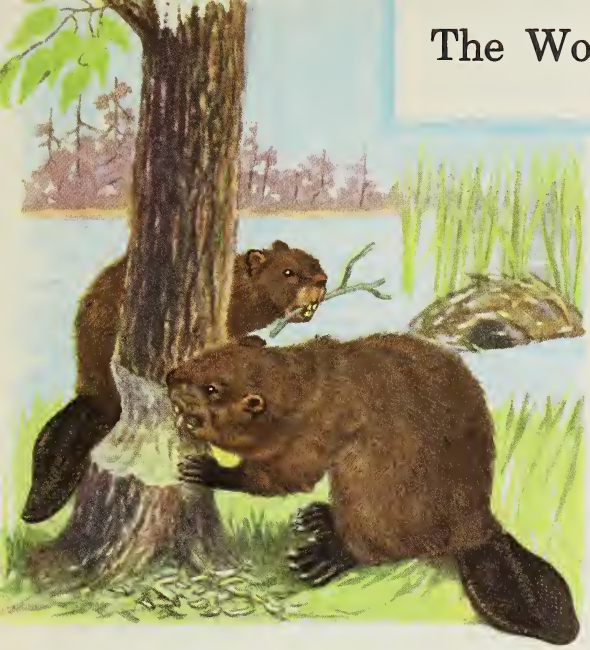
What is the big spider doing in this picture?

See what is stuck in the spider's trap.

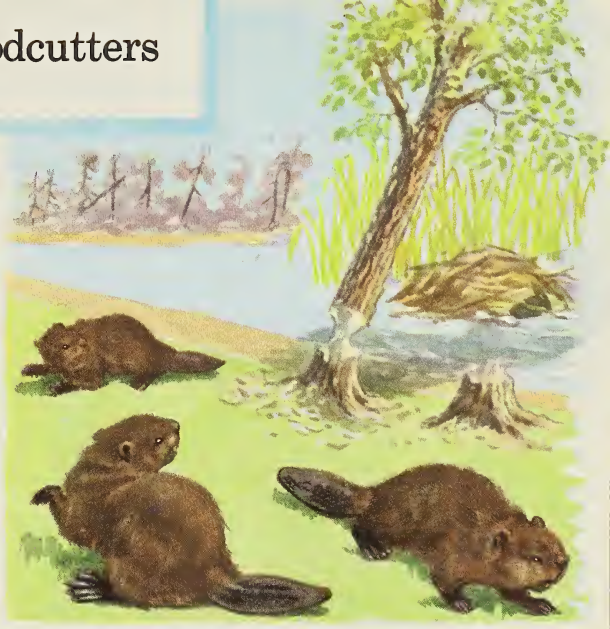
What is the spider putting over the fly?

Now the spider has some food.

The Woodcutters



See how a beaver uses his long front teeth.



What is happening in this picture?

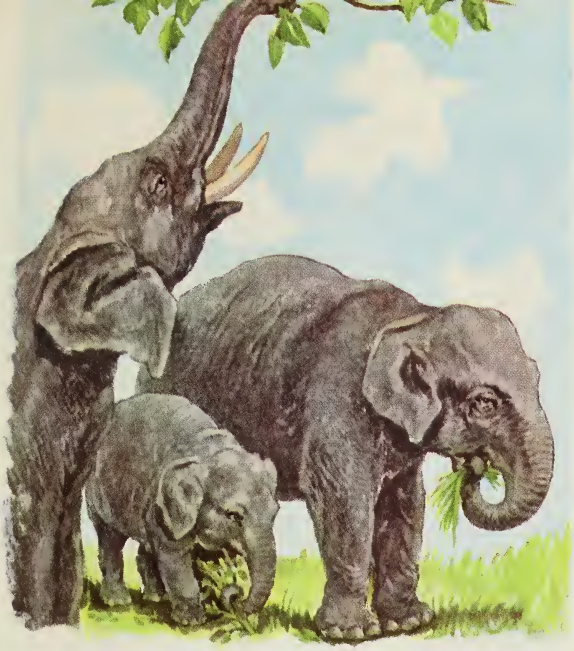
The beavers eat part of the tree.

Parts of the tree are used to make a home.

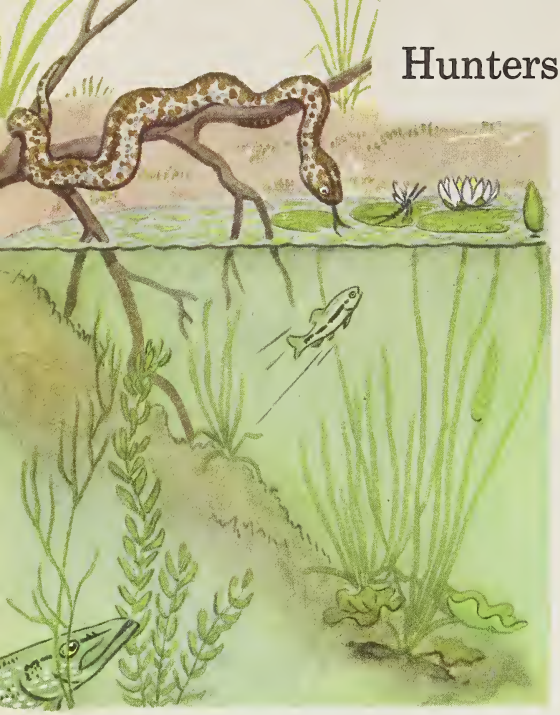
Getting Food on Land

Which animals are catching other animals for food?

Which ones are eating plants?



Hunters That Swim



What is the little fish trying to catch?

What other animals do you think are hungry?

Now a mink is going after the big fish.

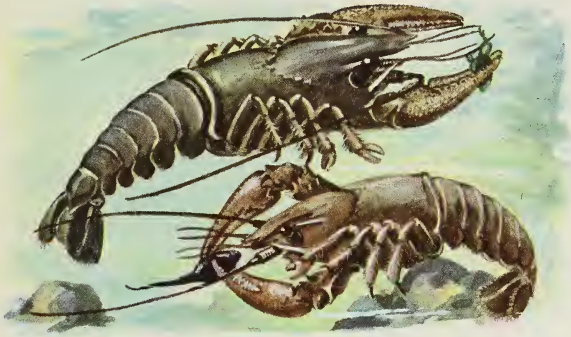
Who do you think will eat the big fish?

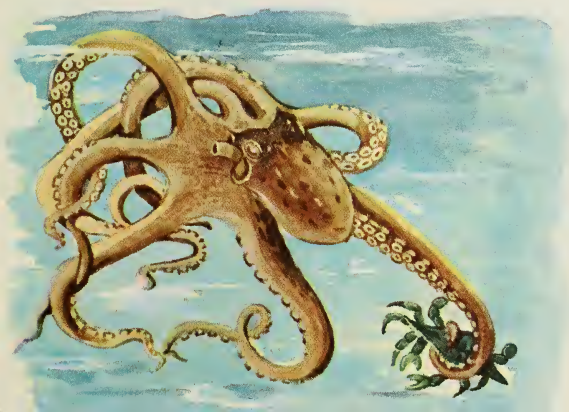
Getting Food in Water

Which animal is eating a plant?

Which animals are catching and eating other animals?

How are they getting their food?



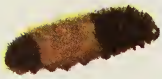


What Happened?

What did the turtles eat?

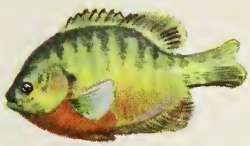
How did they get food?





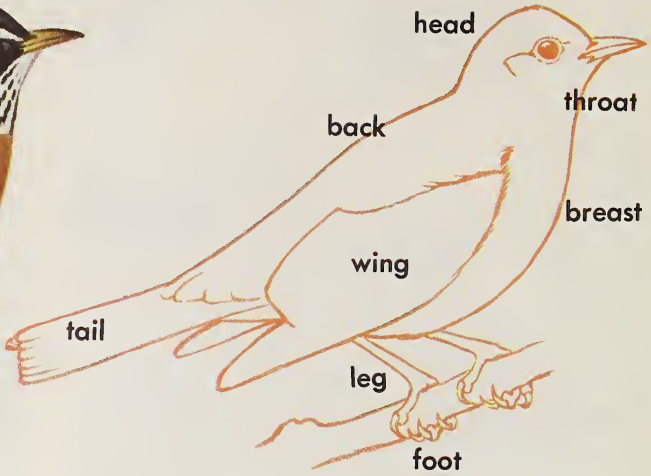





Which animals can get food only on land?

Which animal can get food only in water?

Which animals can get food both on land and in water?



Look at the birds on page 15

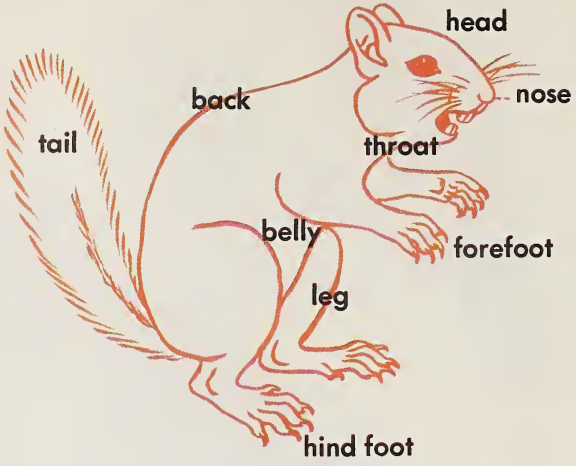
Find a bird that has
- a brown head
- a brown back
- a gray and yellow tail

Find a bird that has
- a blue head and back
- a blue tail
- blue wings
- a red throat and breast

Find a bird that has
- black-and-white wings
- a black tail
- a white breast
- a red head and throat


Bluebird
Cedar waxwing
House wren
Bluejay
Meadow lark
Song sparrow
Redheaded woodpecker
Downy woodpecker

Chipmunk



Look at the mammals on page 17.

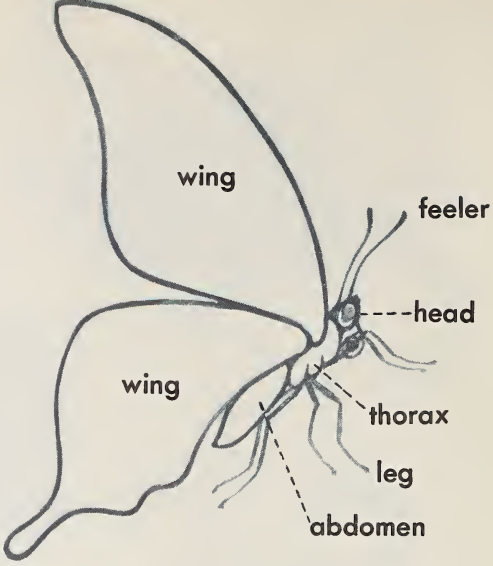
Find a mammal that has
a brown head and back
a yellow throat and belly
a black tip on its tail

Find a mammal that has
a brown head and back
a long tail
a white throat and belly
white feet

Find a mammal that has
a brown head and back
a yellow throat and belly
a long, bushy tail
yellow feet


Muskrat
Deer mouse
Weasel
Mink
Ground hog
Fox squirrel
Raccoon
Opossum

Black swallowtail butterfly



Look at the insects on page 19.

Find an insect that has
- short feelers
- a black-and-yellow thorax
- a black-and-yellow abdomen
- four brown wings

Find an insect that has
- long legs
- long feelers
- red wings
- a green head and thorax

Find an insect that has
- long feelers
- a brown head
- a long, brown abdomen
- green wings

Grasshopper

Bumblebee

Potato beetle

Monarch butterfly

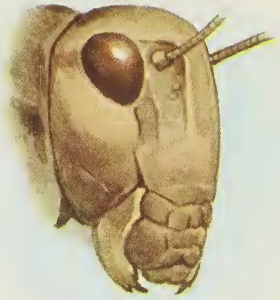
Dragonfly

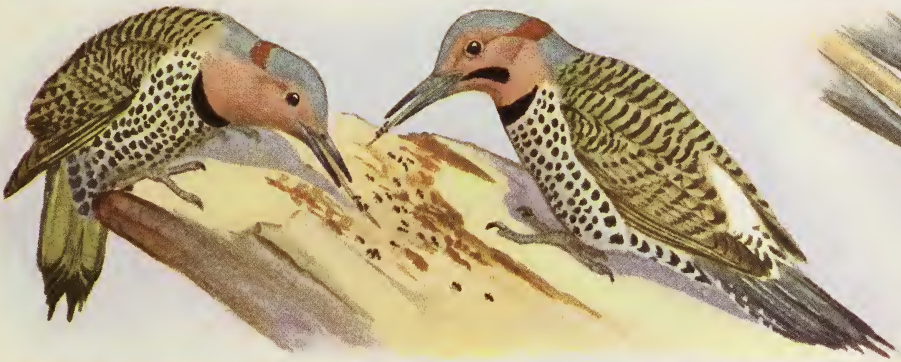
Ladybug

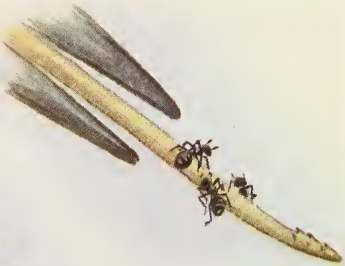
Tiger beetle

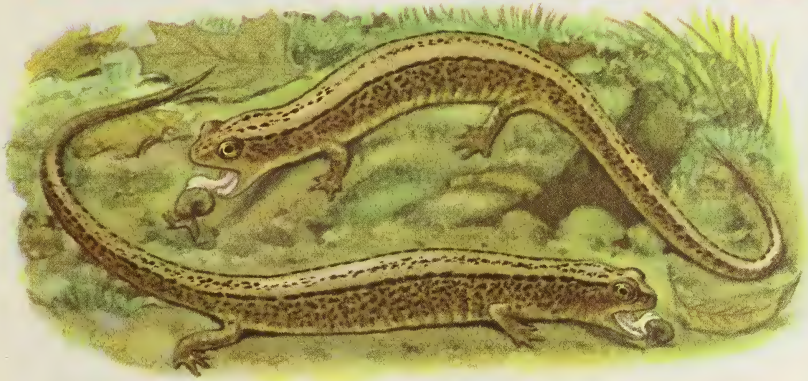
Lacewing fly

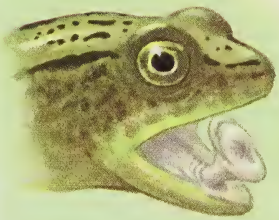
Mouths

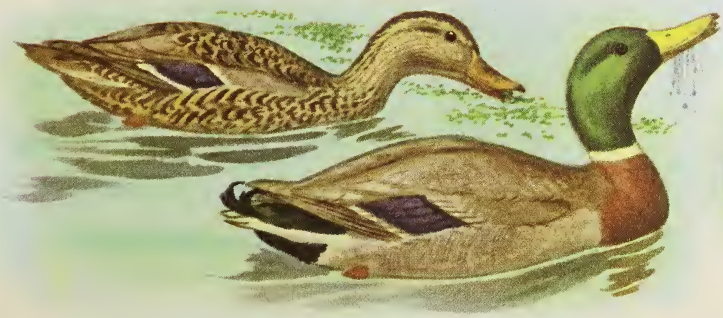


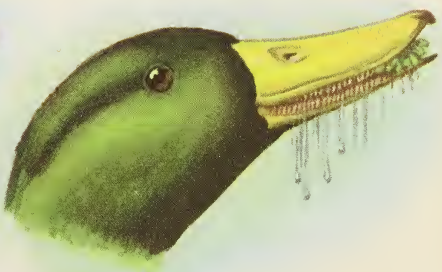












What kind of food does a wildcat eat?

How do teeth like these help it get and eat food?

What kind of food does a horse eat?

How do its front teeth help a horse get food?

What kind of food does a beaver eat?

How do teeth like these help it get its food?

What does a bear eat?

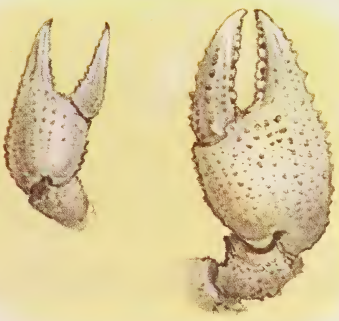
How does a bear use these different kinds of teeth in eating different kinds of food?

Look at the teeth of each animal
and tell what you think it can eat.

Feet

hind foot

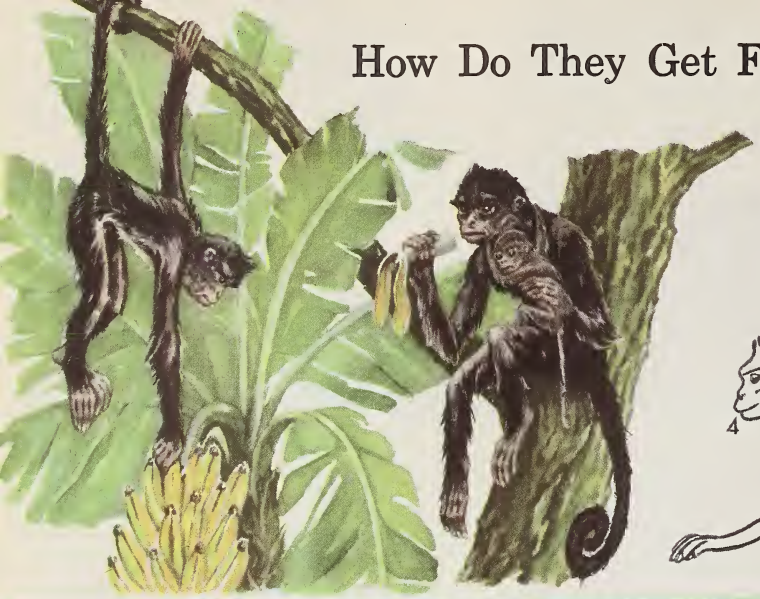
forefoot

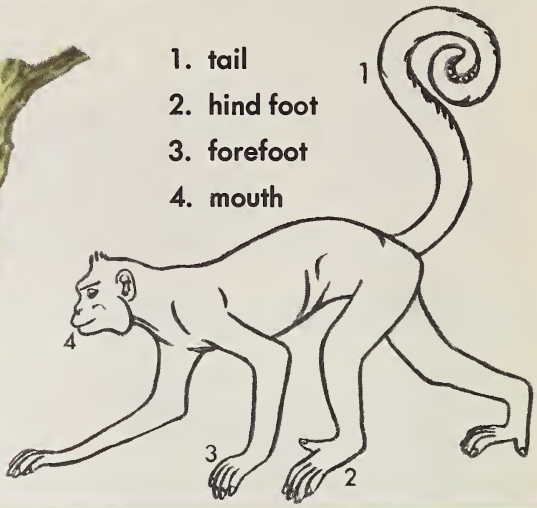


forefoot

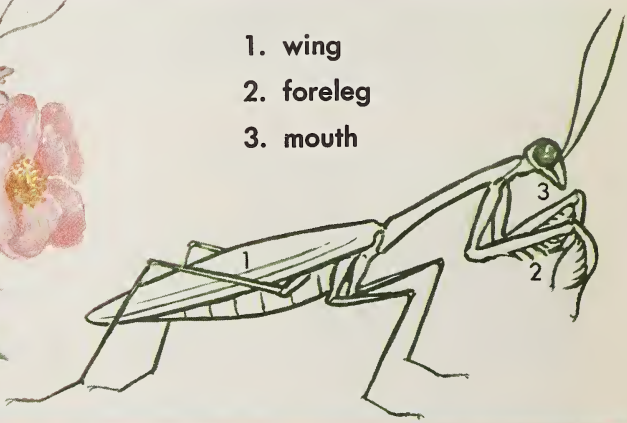
hind foot

How Do They Get Food?



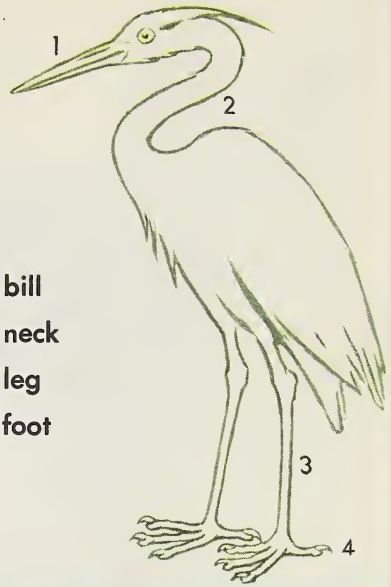


1. tail
2. hind foot
3. forefoot
4. mouth



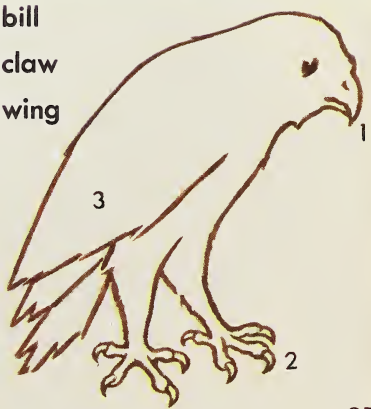
1. wing
2. foreleg
3. mouth

1. mouth
2. wing
3. hind foot



1. bill
2. neck
3. leg
4. foot

1. head
2. mouth
3. forefoot
4. hind foot

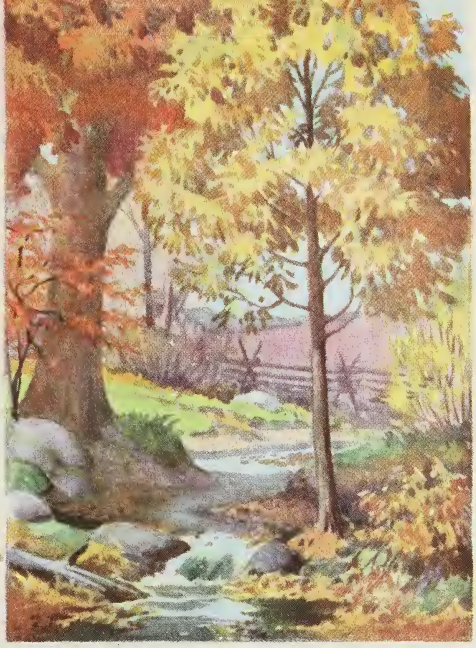


1. bill
2. claw
3. wing

What Is Wrong?

In spring these animals are out looking for food.

In summer we see more animals and more food.



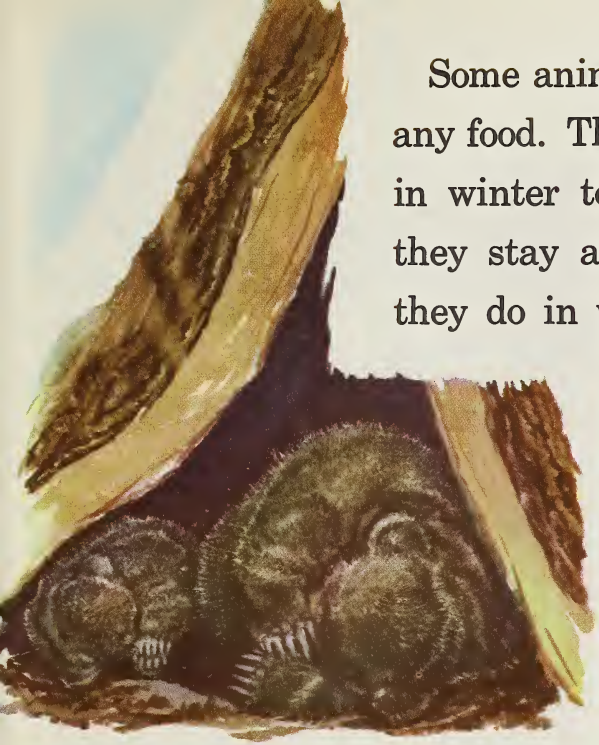
What animals can find food in autumn?

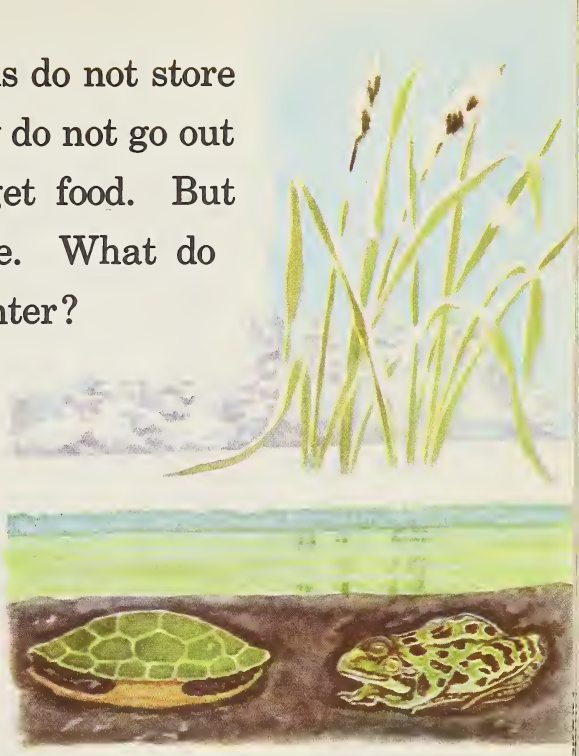
What food-hunters do we see in winter?

Animals in Winter

In winter, food is hard to find. Some animals store food that keeps them alive.

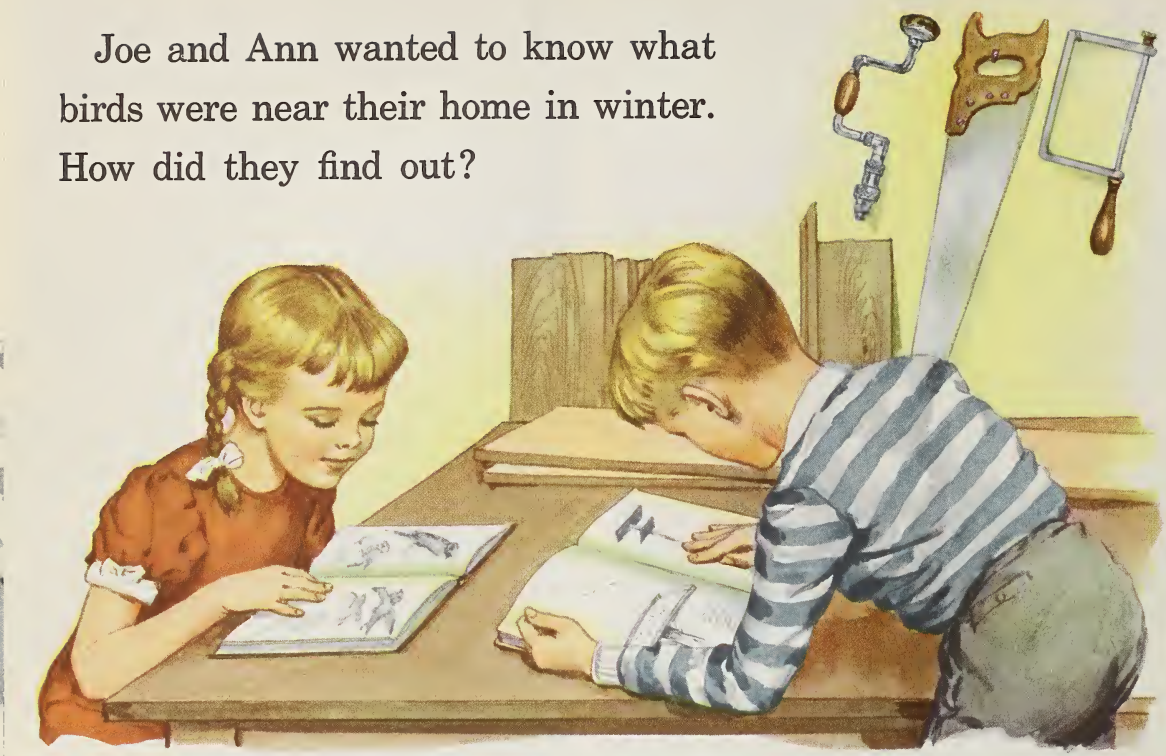
Some animals do not store any food. They do not go out in winter to get food. But they stay alive. What do they do in winter?

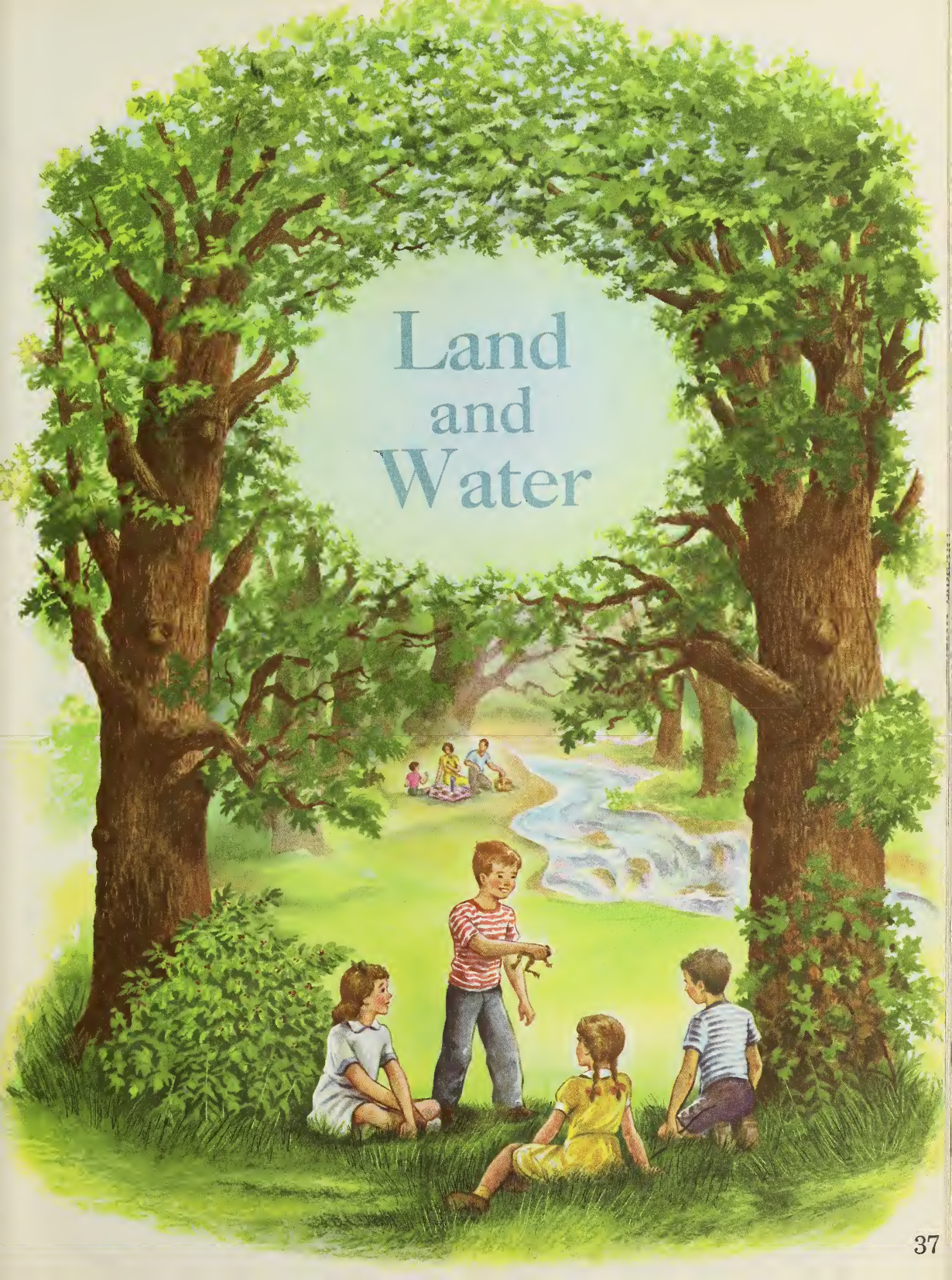




Helping Animals in Winter

Joe and Ann wanted to know what birds were near their home in winter. How did they find out?




Land
and
Water

Picnic Places

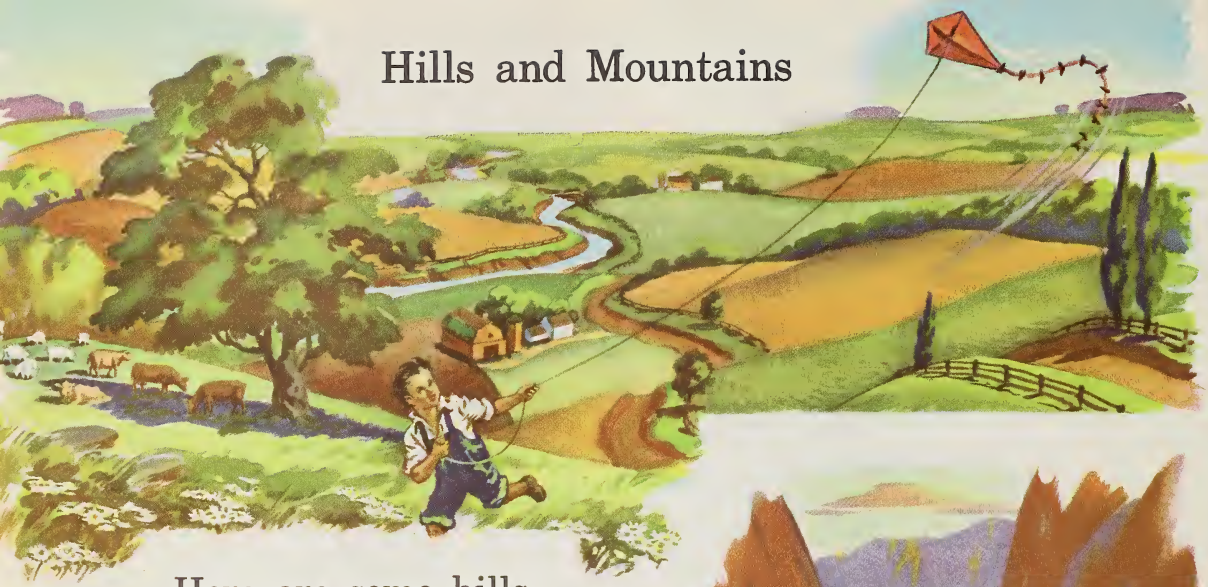
Each of these three pictures shows a good picnic place.

How is each place different from the other two?

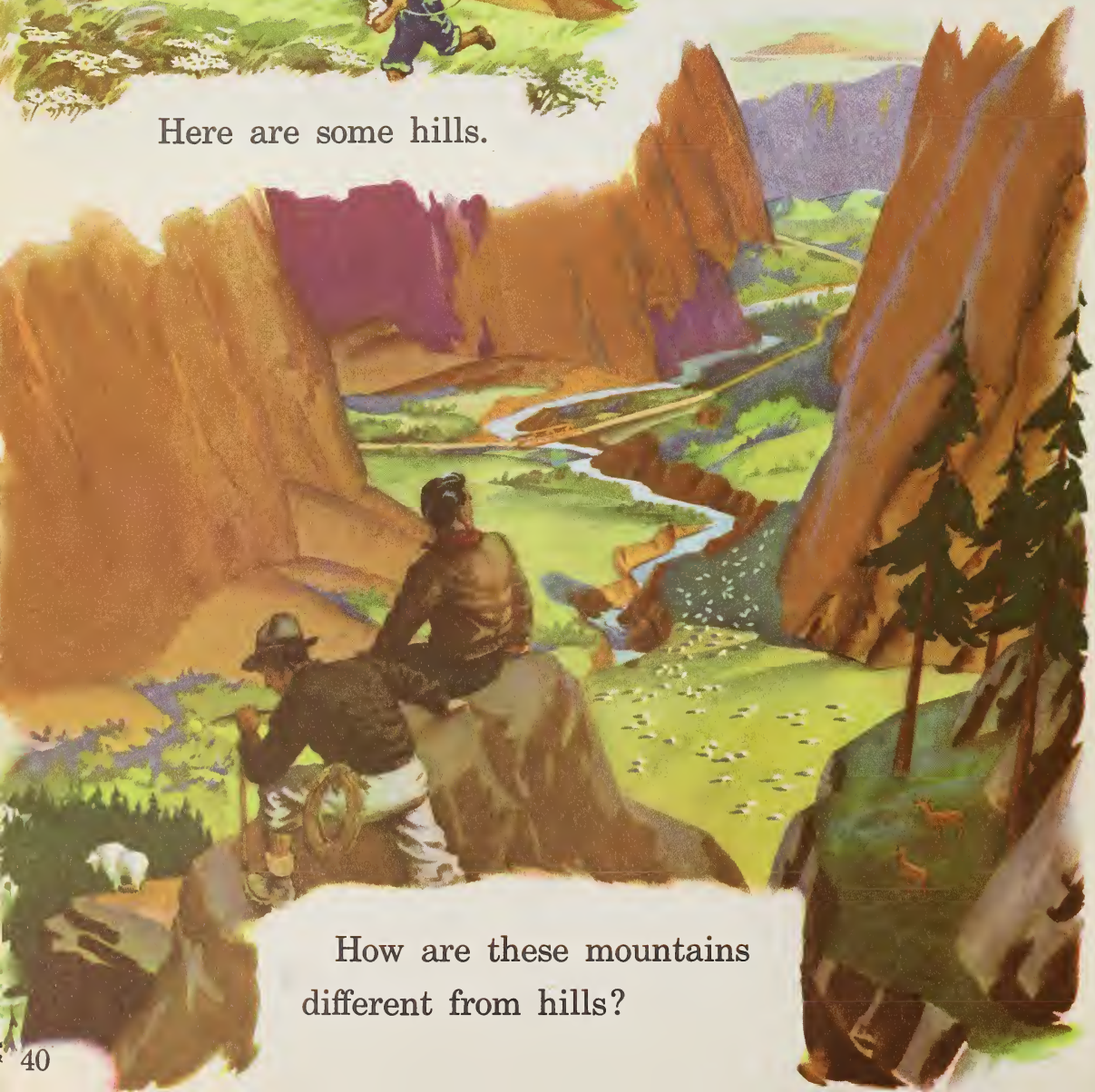
Which places are most like the picnic places near your home?

Which of the places do you like best?

Hills and Mountains



Here are some hills.



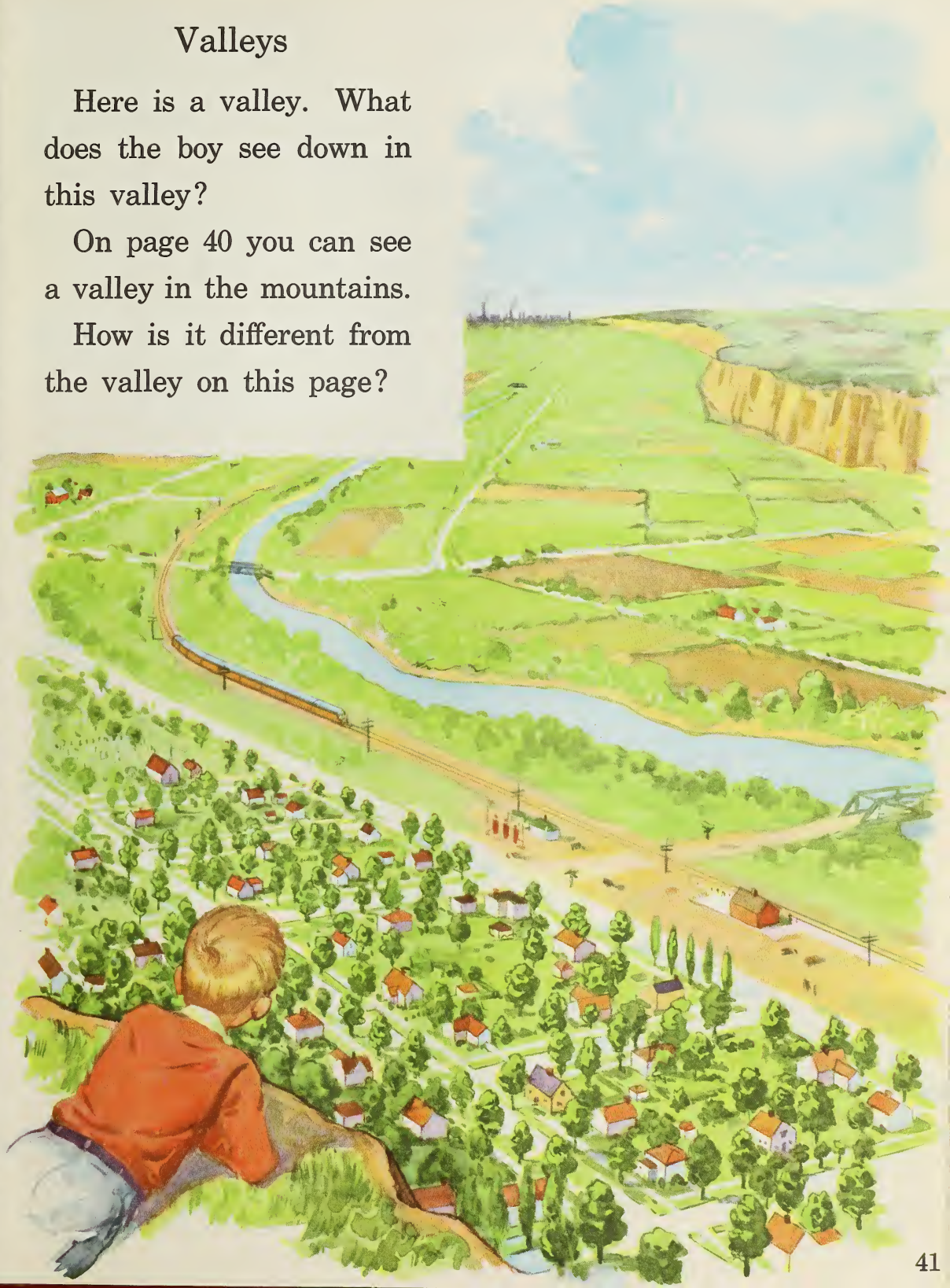
How are these mountains different from hills?

Valleys

Here is a valley. What does the boy see down in this valley?

On page 40 you can see a valley in the mountains.

How is it different from the valley on this page?



Plains

Wide, flat land is called a plain.
This plain has good farm land.

This is a plain, too.

Here is a very dry plain. It is called a desert.

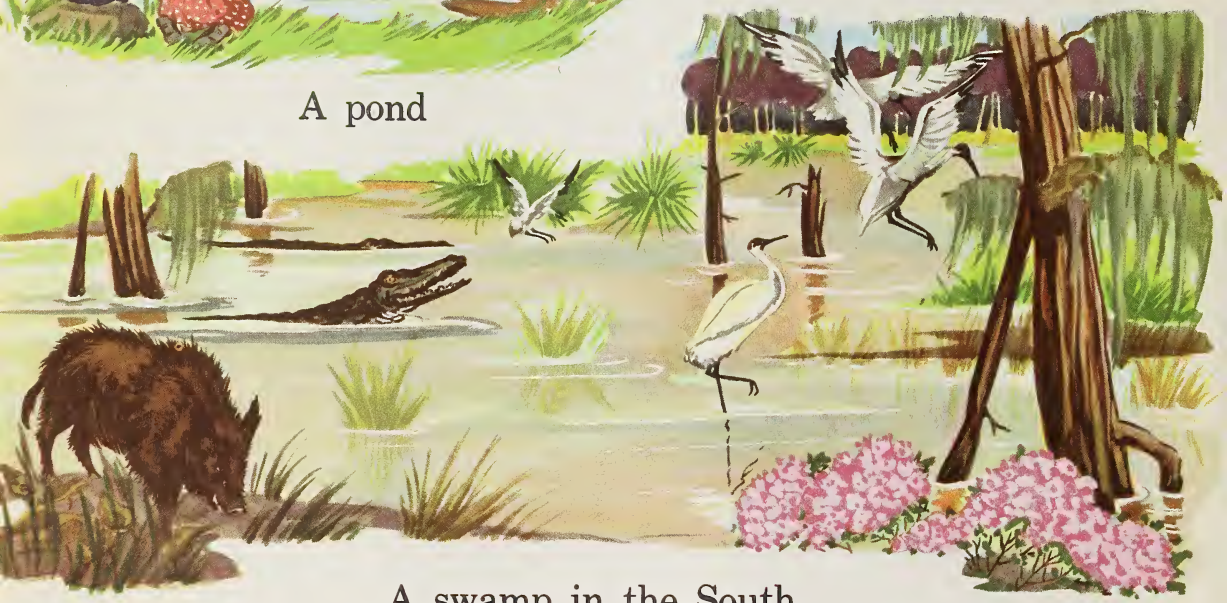
Ponds and Swamps

Tell how the pond is different from swamps.

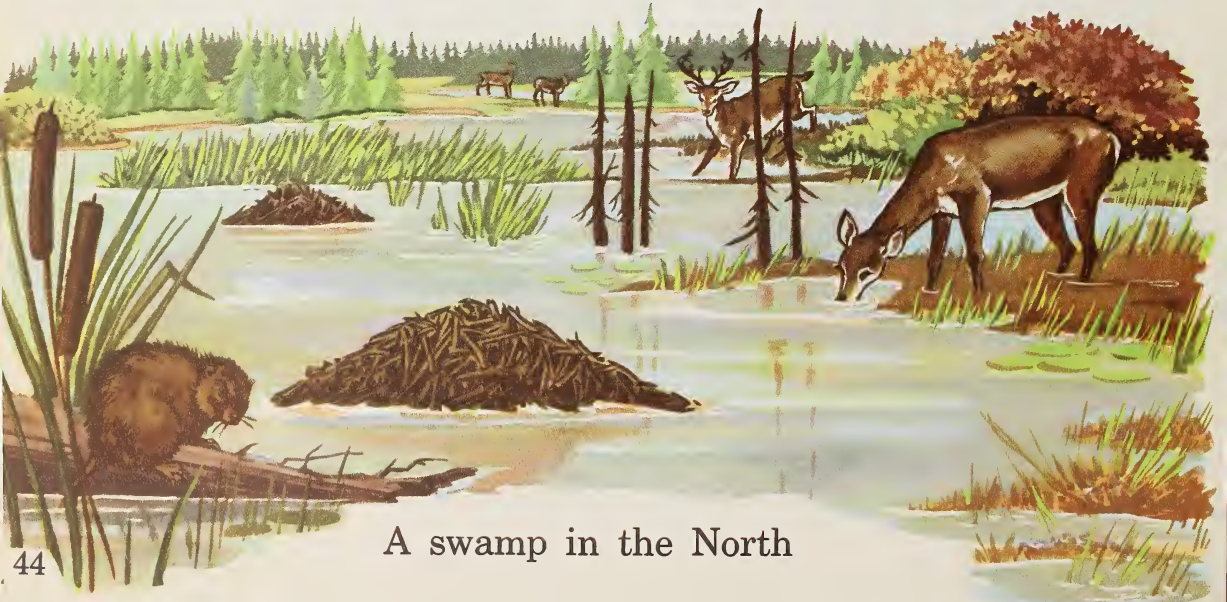
How are the swamps different from each other?

How are they alike?

A pond



A swamp in the South

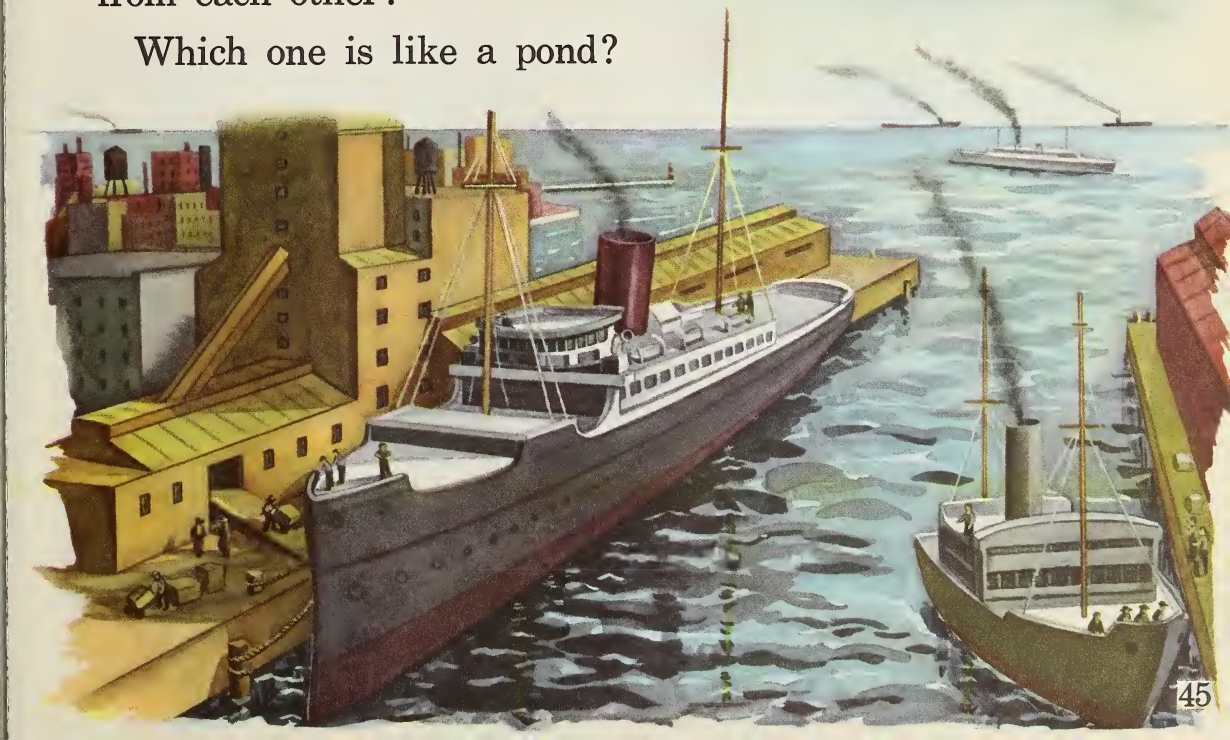


A swamp in the North

Lakes

How are these lakes different from each other?

Which one is like a pond?



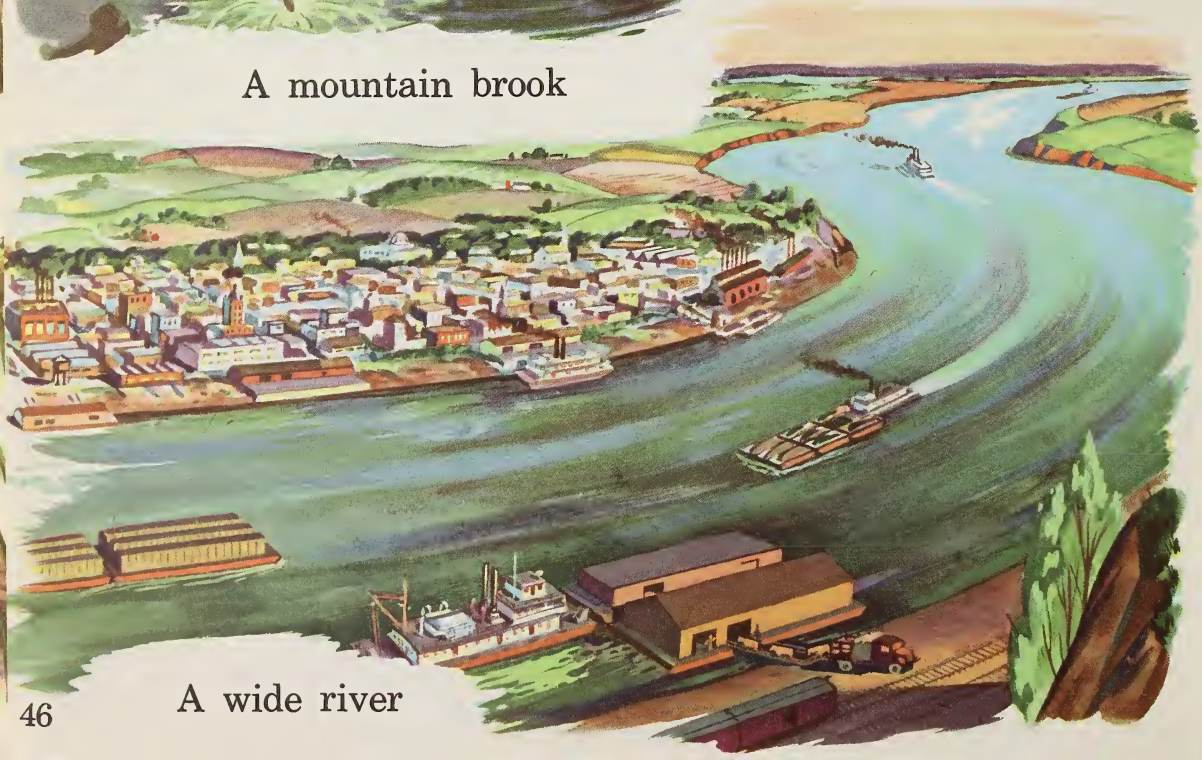
Streams

In what ways are the streams different from each other?

How are they alike?

A creek

A mountain brook



A wide river

Find all the places where streams come together.

Do you think the big river starts at the lake and then runs into all the smaller streams?

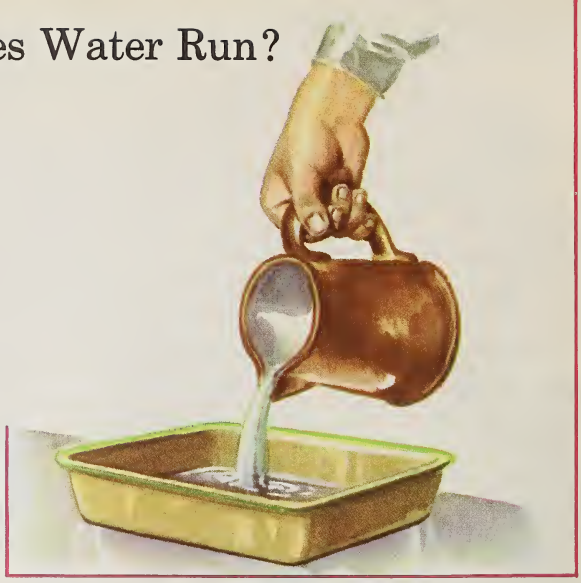
Do you think the small streams start in the hills and run into the big river and then into the lake?

Do what page 48 tells you, and you will know which way streams run.

Which Way Does Water Run?

Get some water and a flat pan. Then do this.

Does the water stay in the pan as long as the pan is not moved?



Now do this experiment. Tip the pan like this to see where the water runs out of the pan.

Did the water run out of the lowest corner of the pan?

Tip up the other end of the pan to see where the water runs out.

Tip the pan up higher and higher to see if the water runs faster.

Which way do these streams run?

How did the three experiments on page 48 help you find out which way water always runs?

Where does the big stream start?

Which streams run very, very fast?

How did the last experiment on page 48 help you find out which streams run very fast?

Land and Water

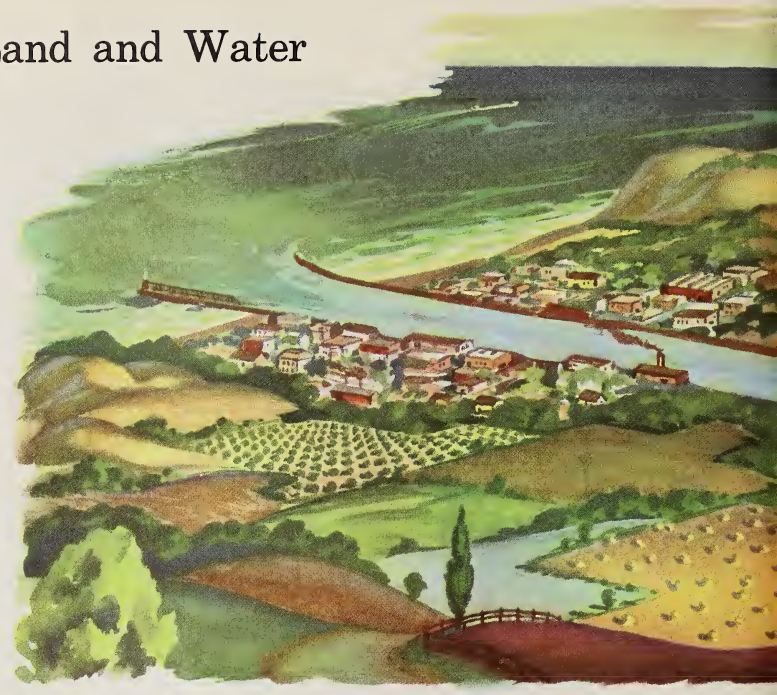
In which picture do you see hills?

Where do you see high mountains?

Find the valleys.

Find two plains that have farms.

Where do you see large forests?



Are there streams in all the valleys?

Find the streams and tell where they start.

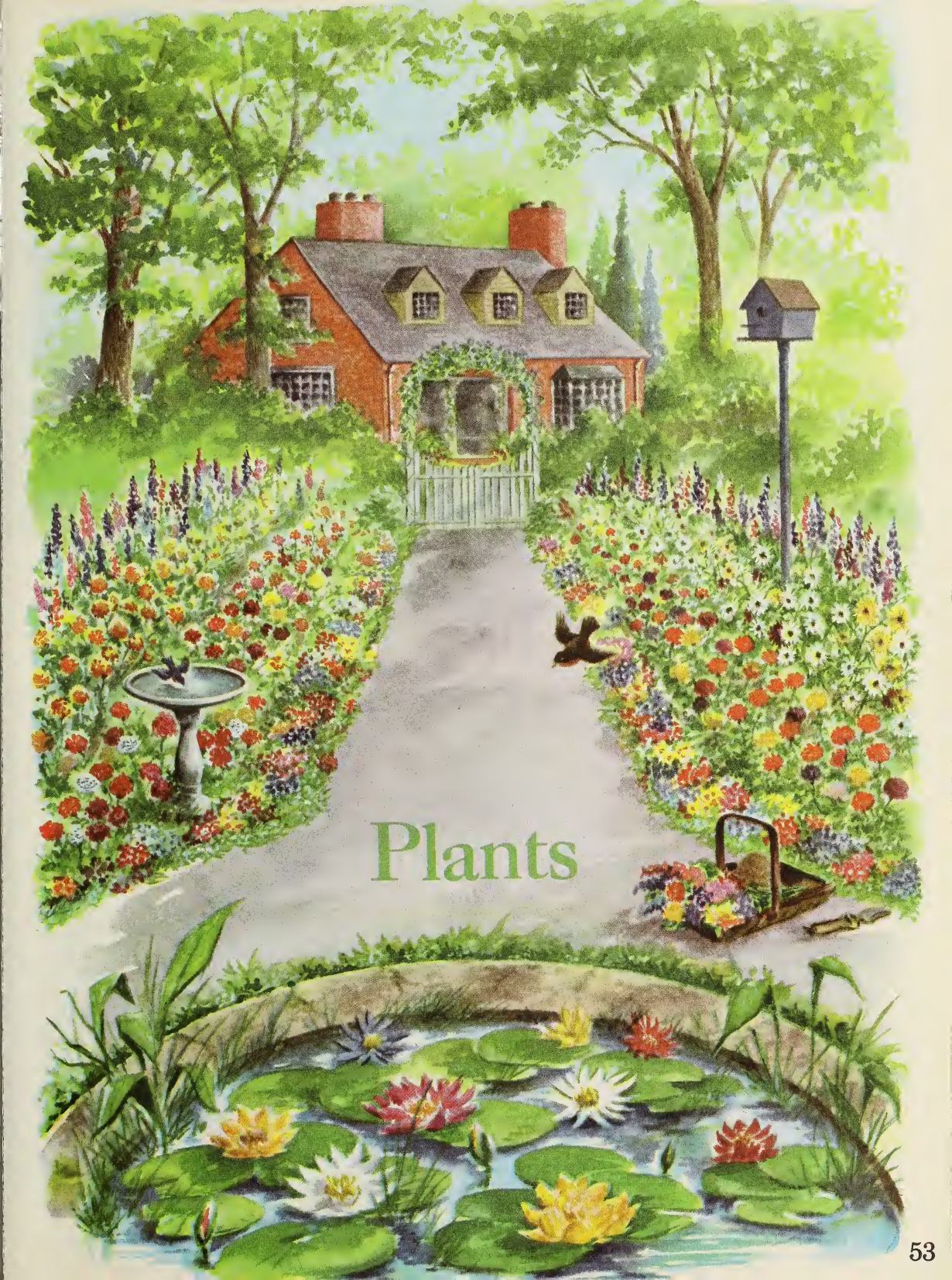
In some places the streams run very fast. Find these places.

Find a place that looks like the land near your home.

A Sandbox Picture

These children want to show how the land near their school looks.

Why would this be a good place to live?


Plants

A Place for a Garden

These children are looking for a good place to make a school garden. The place in Picture 1 is sunny all day and the soil is black.

Picture 2 shows a place that has black soil like the soil in Picture 1.

The houses and trees make shade here most of the day.

The place in Picture 3 has shade most of the day, too.

There are many, many stones in the ground.

The place in Picture 4 has many stones, too. There is no shade here.

The children did not know which place would be best. So they went back to school to tell the other children all about the four places.

2

4

Do Plants Need Soil?

The children wanted to find out if plants need soil. So they put one bean seed in a box of soil and one in a jar of stones.

Water was put into the jar until it was over part of the seed.

The seed in the box of soil was watered, too.

This picture shows what happened in a few days.

Are the two bean plants the same size?

In a few more days the plants were like this. Do they look alike?

Tell how each bean plant has changed from the way it looked in Picture 3.

4

Then in three weeks the plants were like this.

How have they changed from the way they looked in Picture 4?

How are they different from each other?

5

On which plant are new beans starting to grow?

Plant beans in these two ways and see if the ones without soil will grow new beans.

6

Do Plants Need Sunlight?

These new plants came from tomato seeds.

They will be put in the school garden as soon as the weather is warmer.

All the plants were in the sunlight, and they had all the water they needed.

Soon they were like this. How have they changed?

One box of plants was moved out of the sunlight. It was put in a very dark place.

The plants in the dark had water. But after one week they looked like this. How have all these plants changed?

These plants have been in the light all the time. In what ways are these plants different from the ones in the dark?

After the children found out that plants must have soil and sunlight, they knew the kind of place they should pick for a garden.

Look at pages 54 and 55 and find the place you think they picked.

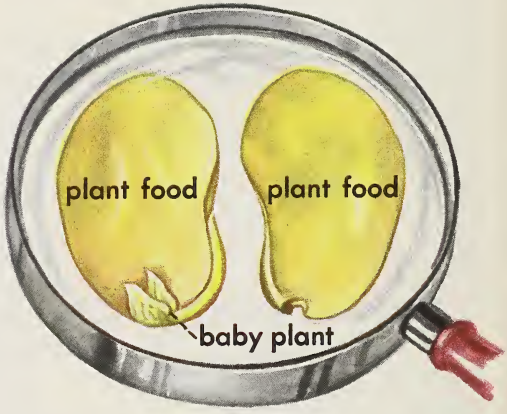
How Plants Grow from Seeds

Keep some bean seeds in water for a day. Then open them like this.

What is inside a seed?

When a new plant starts growing, it uses the food that is inside the seed.

A new plant cannot start to grow until water makes the seed soft.



A growing plant soon uses all of the food in the seed. Then it makes its own food.

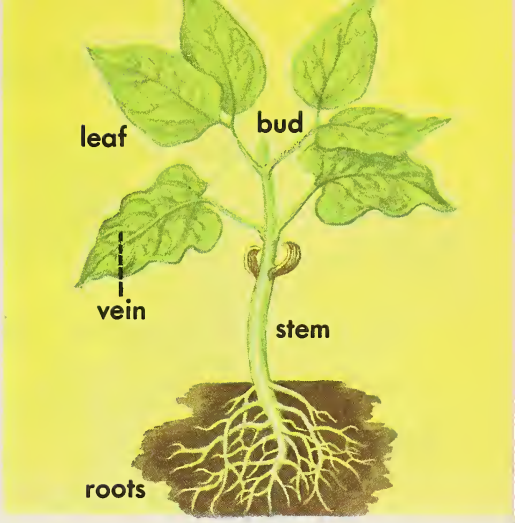
One of these two plants has used most of the food in the seed. Which one is it?

Name the parts of a plant.

What part holds leaves up to the light?

What part is in the soil?

Food is made in the green parts of a plant. Where is most of the green coloring?



Both these tomato plants have had water. But only the green one has been in the light all the time.

Only green plants make food. Do you think sunlight helps a plant make food?

The green plant has had water every day. The other plant has had no water for a week.

Do you think that plants can stay green and make food without water?

How Plants Take in Water

Water cannot help plants make food until it gets into their leaves.

Do you think leaves take in water when rain falls on them?

These two plants had not been watered for three days. Then both were watered but not in the same way.

Which parts of each plant had water?

Soon the plants looked like this.

Which plant looks as if it can make food?

Which part of a plant takes in water?

How Water Gets into Leaves

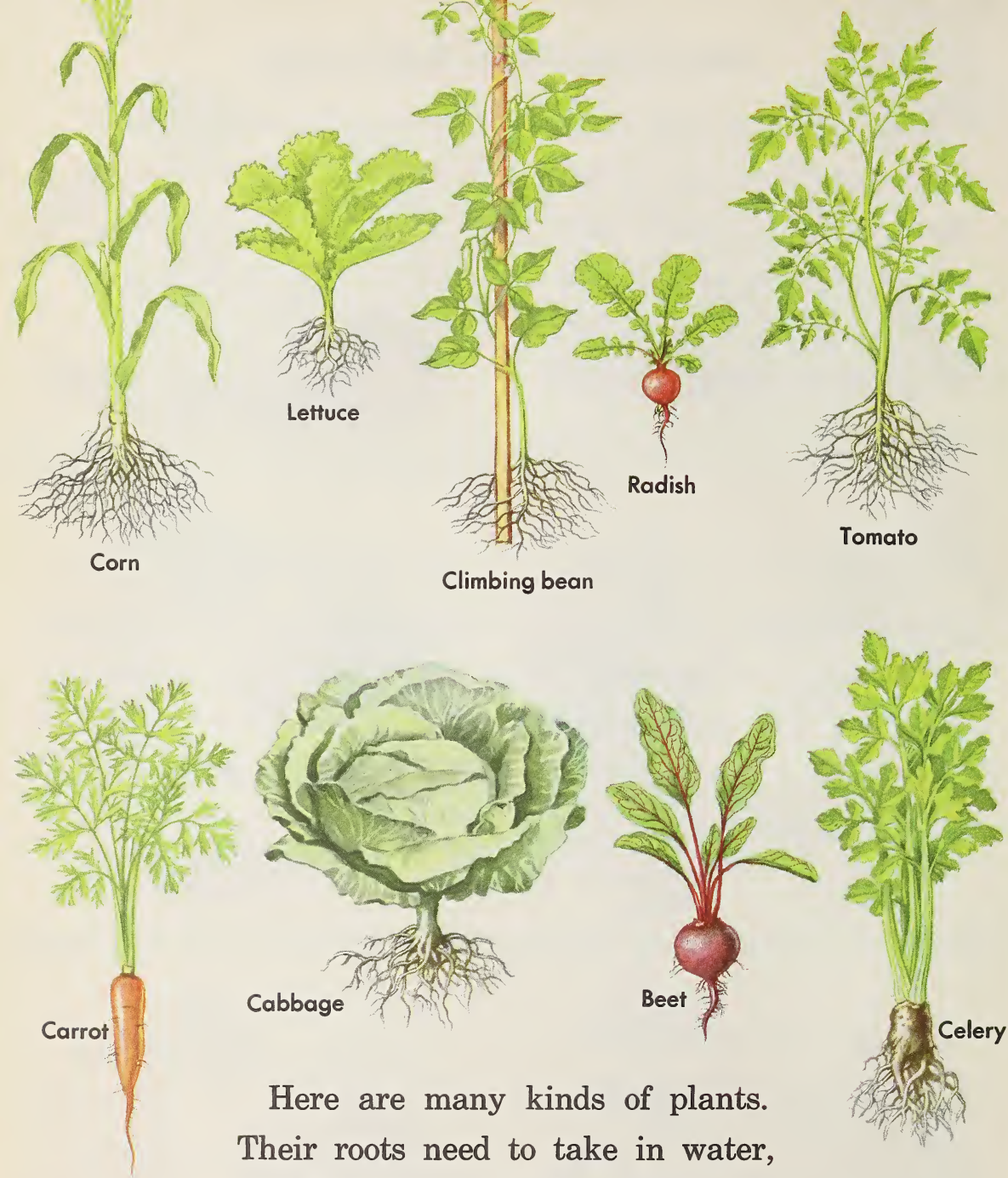
Leaves cannot make food if no water gets into them. This experiment will show that water goes up from the roots to the leaves. What must you do first?

What do you see in the roots and stem?

The red color goes into the plant with the water, and it shows how far the water has gone.

How do you know water has gone into the leaves?

When water from the soil goes into leaves, it takes things from the soil along with it. Leaves need these things to make food.



Here are many kinds of plants. Their roots need to take in water, and their leaves need sunlight. So they should not be planted too near each other in a garden.

The Children's Garden

These pictures show how the garden was made and what was planted in it.

Leaves, Stems, and Roots

Do these leaves look alike?

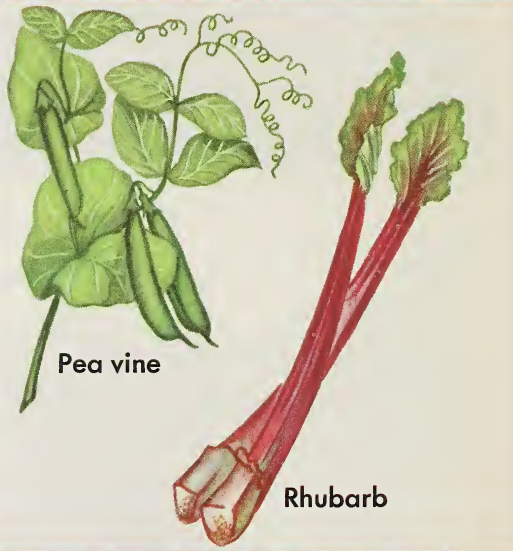
Different kinds of plants have different kinds of leaves. But most leaves are green, and food is made in all green leaves.

Which leaves do we eat?

These plant stems do not all look alike. But all of them hold leaves up into the light.

All stems carry water to the leaves. And they carry food that is made in the leaves to other parts of the plant.

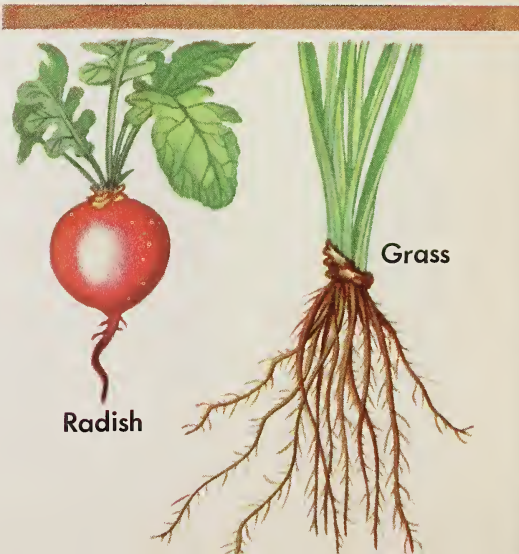
Which stems do we eat?



Roots do not all look alike. But most roots take in water and hold plants in the ground.

The roots that we eat have much plant food in them.

Which roots are good to eat?



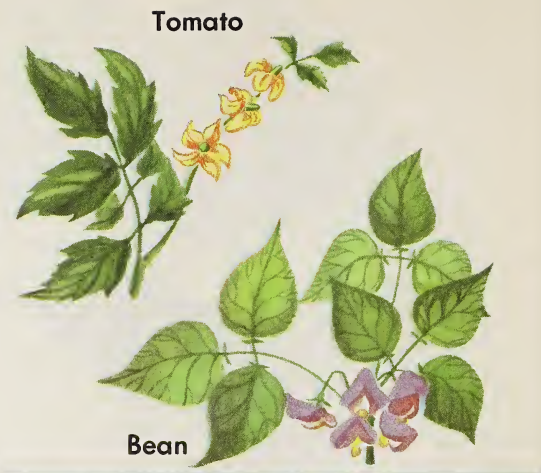

Lettuce
Locust
Fern
Beet
Hickory
Water lily
Celery
Wild rose
Tree
Asparagus
Corn
Sweet potato
Turnip
Violet
Clover

Flowers, Seeds, and Bulbs

Do any two of these kinds of flowers look just alike?

Different kinds of plants have different kinds of flowers. But all flowers make seeds.

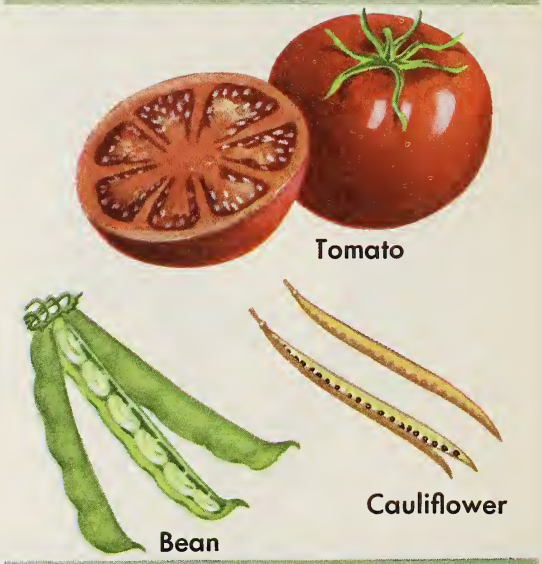
We eat the flowers of the cauliflower plant.



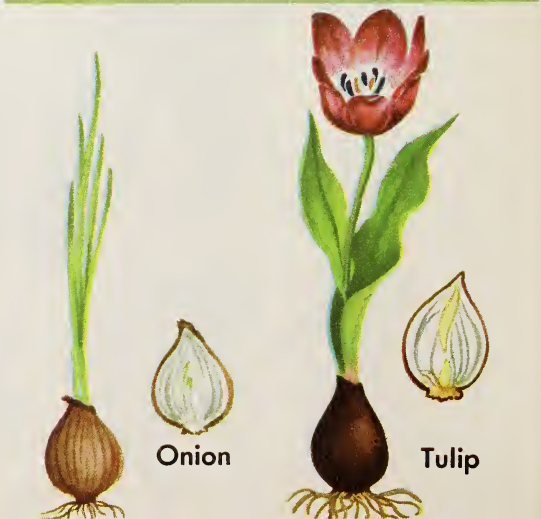
Here are the seeds that the flowers make. How are they different from each other?

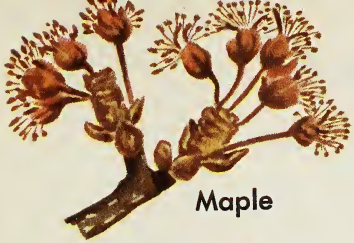
All seeds are alike in one way. Each seed has a new plant inside it and food that has been stored.

Which seeds do we eat?

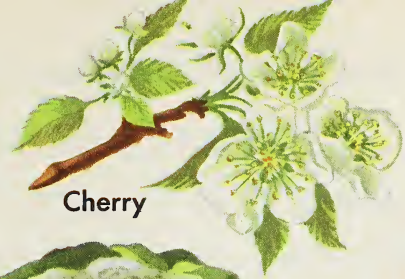


Some kinds of plants have bulbs under the ground. Much food is stored in bulbs, and new plants grow from them. Which bulb is good to eat?





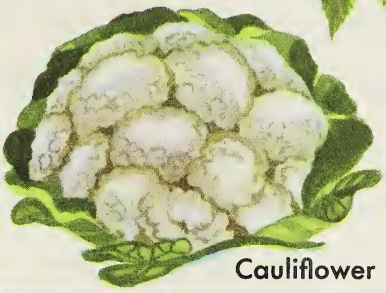
Maple



Cherry

Radish

Hickory



Cauliflower

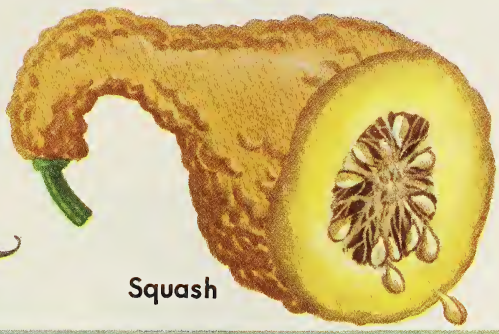
Squash

Maple

Hickory

Cherry

Radish



Squash

Daffodil

Hyacinth

Narcissus

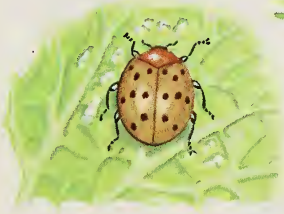
Enemies of Garden Plants

Garden plants have many enemies. Which of these animals eat leaves? Which animal cuts stems?

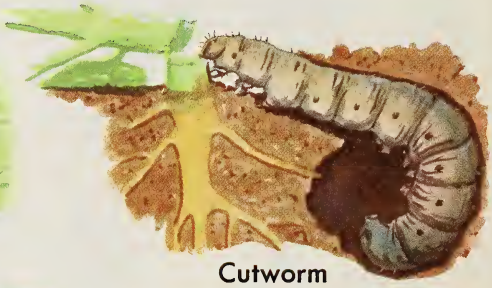
Find the chinch bug on the stem of a corn plant.

Other animals help us keep these enemies out of our gardens. Find some animals in this book that eat these enemies of plants.

Cabbage worm



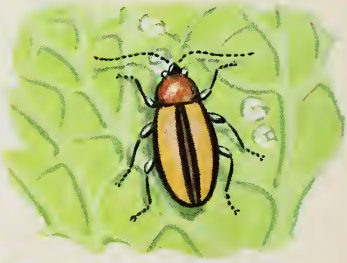
Bean beetle



Cutworm

Corn-ear worm

Tomato lice



Cucumber beetle

Leaf hopper

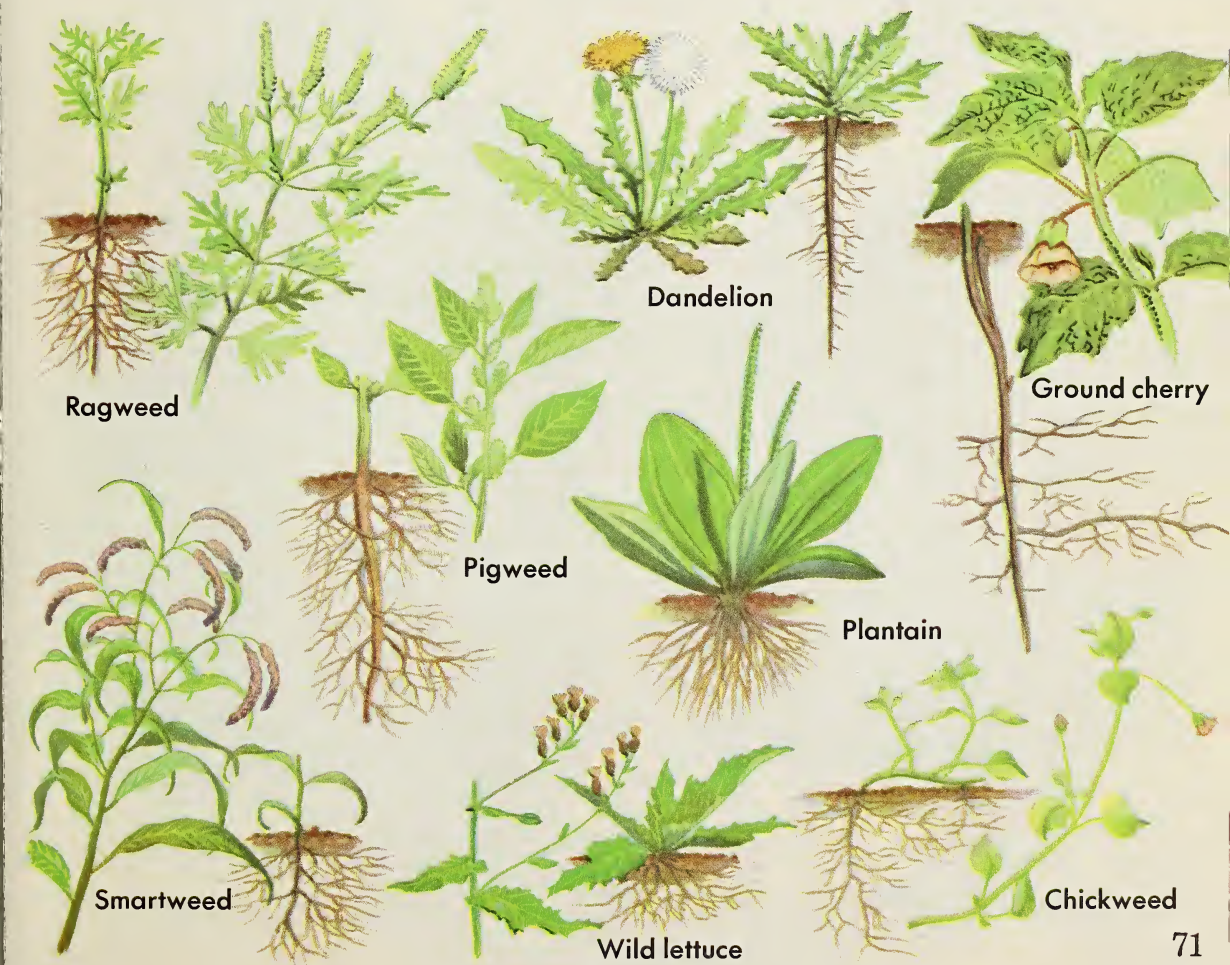
Tomato worm

Chinch bug

Weeds are plants that should not be in a garden. They are enemies, too, for their leaves keep light from plants that grow near them. Their roots take much water from the soil.

Here are some of the weeds that you may find in your garden. You must cut them down or pull the roots from the ground.

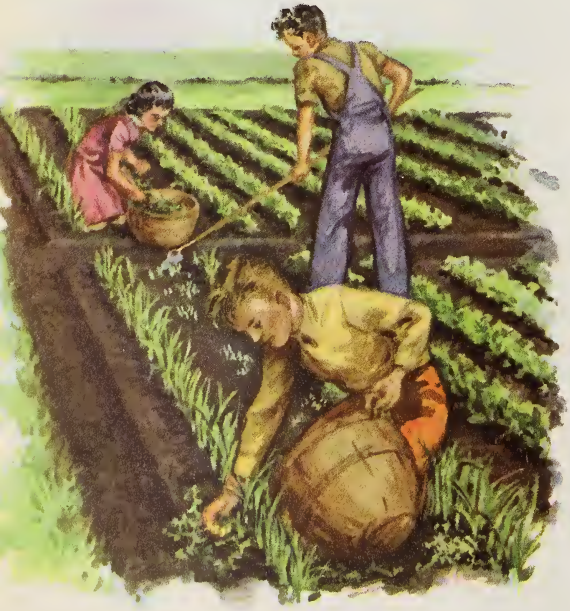
Which weeds have you seen?



Working in a Garden

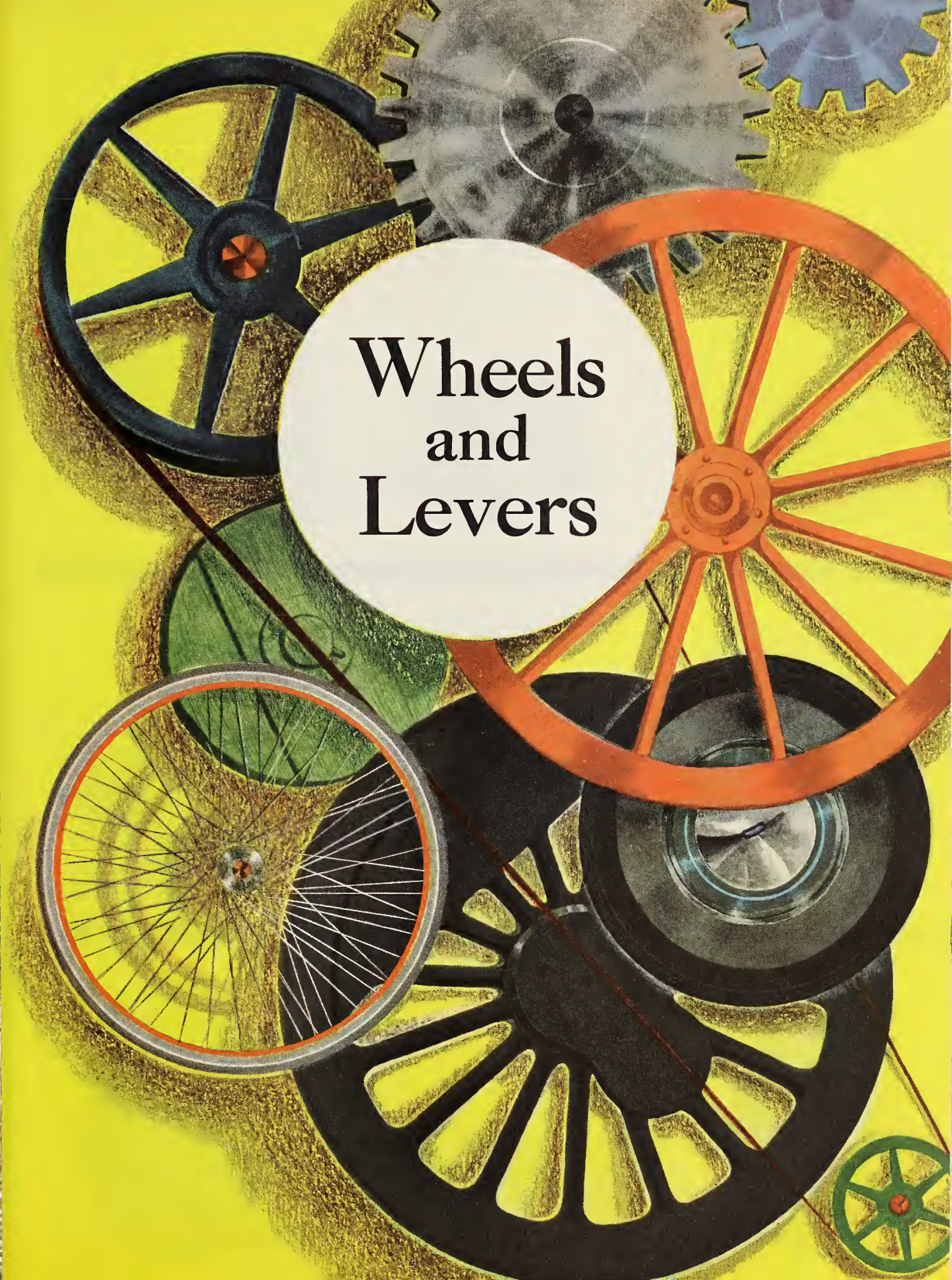
Why do tomato plants need so much room?

Why are some carrot plants being pulled up?



Why are the children weeding the onions?

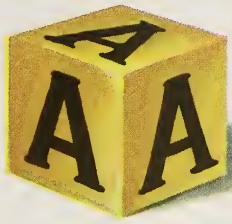
Why must the boys do this to the plants?

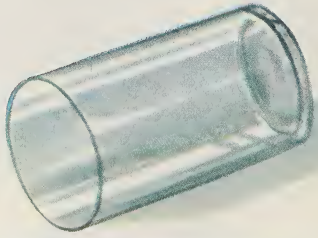

Wheels
and
Levers

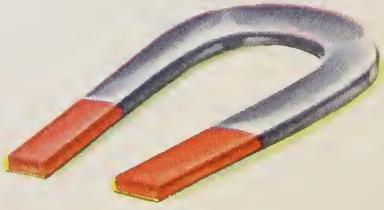
Things That Roll

Look at each row of pictures and tell which things can roll.

Which of these things are round?







Which things are round like a pencil?
Which things are round like a ball?
Which things are round like a wheel?
Can all these things roll?

How Wheels Help Us

It is hard to move heavy things that rub along the ground or floor.

Which pictures show an easy way to move heavy things?

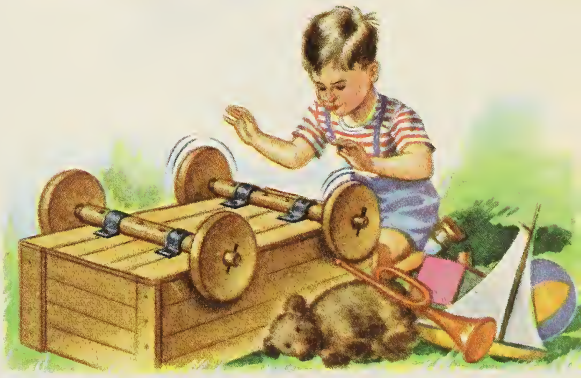
How do wheels help do work?

Bobby wanted to move all his toys. He put them in a box so that he could pull them. But it was very hard to move the box. Tell why.

Bobby found four wheels. He put them on the box to make a wagon. But the wheels could not turn. Do you see why?

Father put two sticks on the box. He put the wheels on the ends of the sticks. Then the wheels had axles.

Did the wheels turn on the axles?



At last Bobby had a good wagon. Was it easy to pull the load of toys then?

Why do wheels need axles?

Wheels That Move Things

Find the axles of all these wheels.

Why do these wheels need axles?

What makes these wheels roll from place to place?

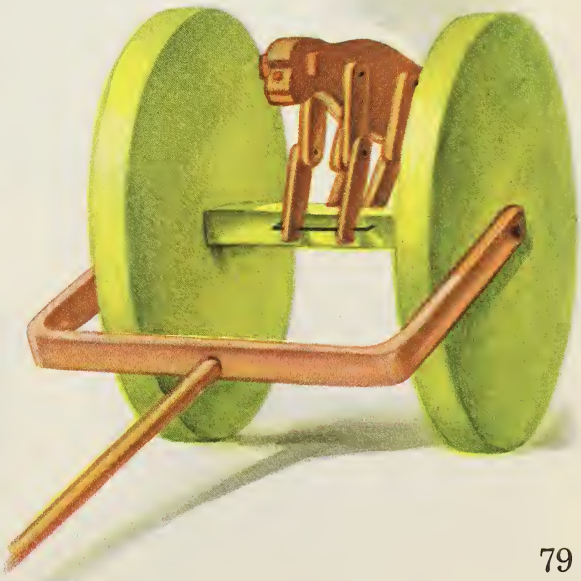
Look at the axle of the big front wheel.

The front axle turns round and round, and it makes the big wheel turn with it.

What makes the front axle turn?

When the wheels on this toy go round, the axle turns with them.

What will happen to the monkey when this toy is pulled along the floor?



Wheels That Stay in One Place

These wheels turn, but they do not roll from place to place.

Find the axle of each wheel.

What makes each wheel turn?

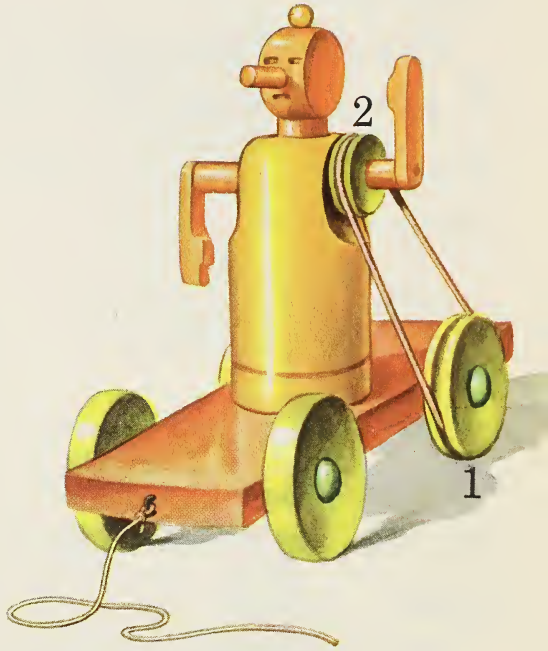
Wheels That Turn Other Wheels

Which wheels on this toy roll along the floor?

Which wheels have a belt around them?

When Wheel 1 is turning, the belt moves, too, and it turns Wheel 2.

When Wheel 2 turns, it makes the man's hands go round and round. Tell why.



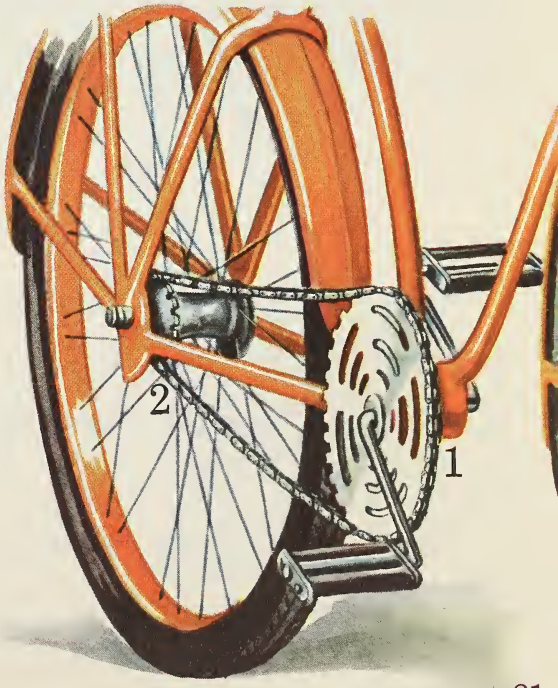
Wheel 1 and Wheel 2 have teeth. Find these wheels.

A chain fits over the teeth of Wheels 1 and 2. The chain is a belt. Find it.

How can Wheel 1 be turned?

How does Wheel 1 turn Wheel 2?

Tell what will happen when Wheel 2 is turned.

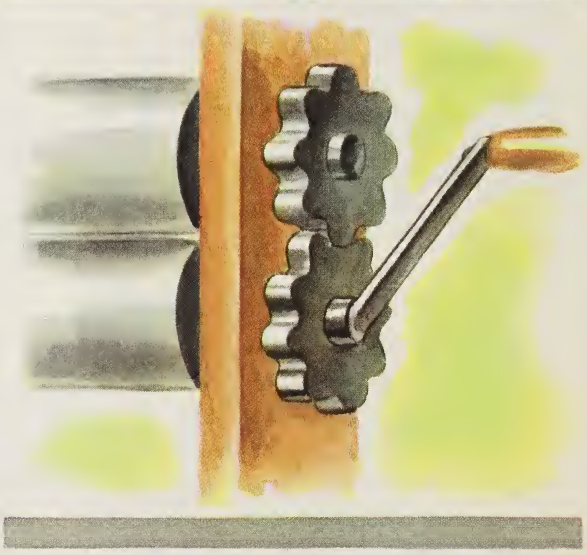


This machine has wheels with teeth. The wheels are on axles that turn.

Only one of the axles can be turned by hand. But the wheel on it turns the other wheel and axle.

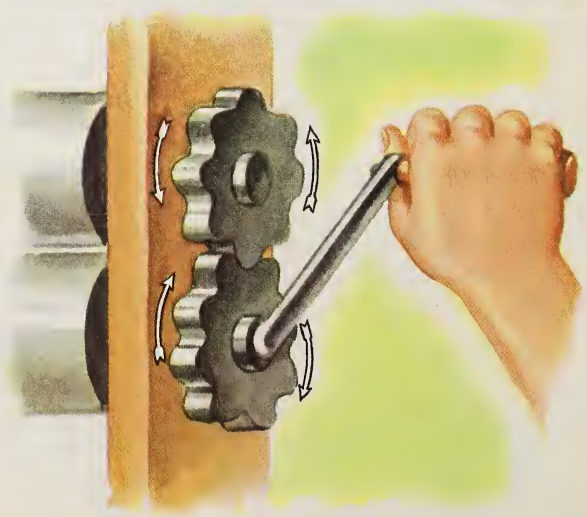
This picture shows how the teeth of one wheel fit into the teeth of the other wheel.

Wheels with teeth are called cog wheels. How do these help do work?



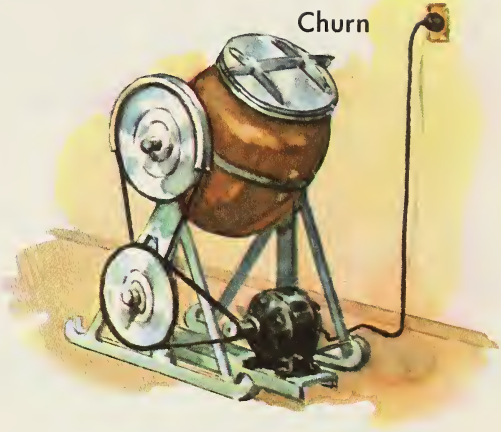
Which wheel and axle is being turned? Which way is the wheel going? How do you know?

Which way is the other wheel going?

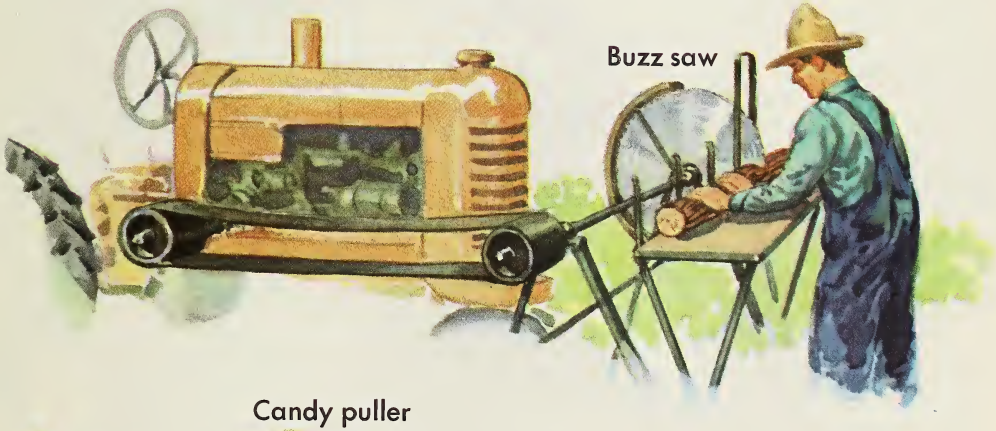


Tell how wheels are helping
to do work in these pictures.

Egg beater

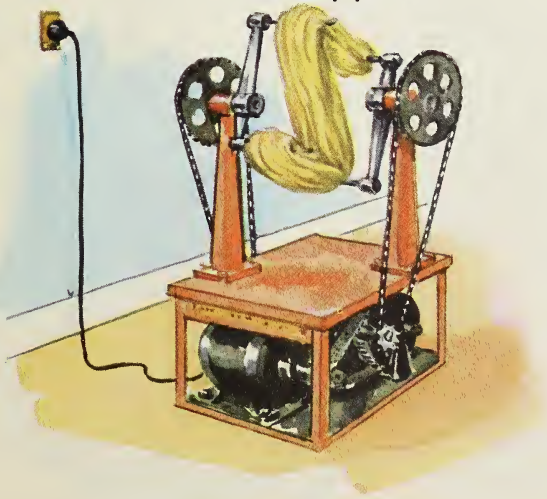


Churn



Buzz saw

Candy puller



Orange squeezer

Another Kind of Wheel

This wheel turns on an axle. A rope fits around the wheel. When the rope is pulled, the wheel turns.

This kind of wheel is called a pulley.

The man on the ground uses a pulley to get paint up to the painter.

How could the painter get his paint without a pulley?

How Do These Pulleys Help?

How a Stone Was Moved

Joe and Jane want to get this big stone out of their garden.

They are using a bar of wood to help move the stone.

What happens as the children push down on the end of the bar?

What will happen if the end of the bar is pushed down farther?

What has happened in this picture?

Now the stone can be moved away.

The children used a lever to lift the stone.

Experiments with a Lever

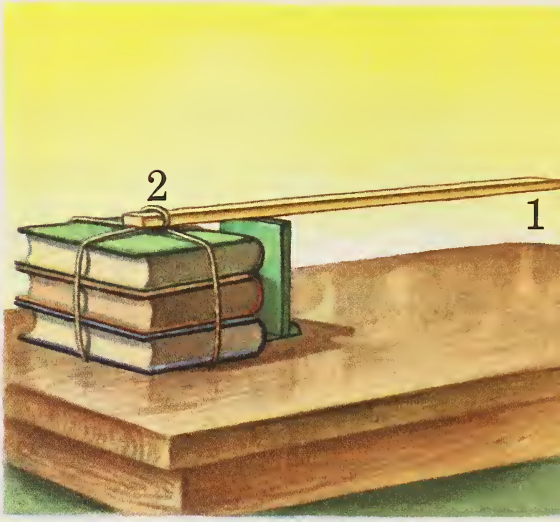
Tie three big, heavy books together the way this picture shows you.

Then see if you can lift the load with one finger.

A lever can help lift the books. As End 1 is pushed down, End 2 comes up.

What does the bar rest on when it lifts the books?

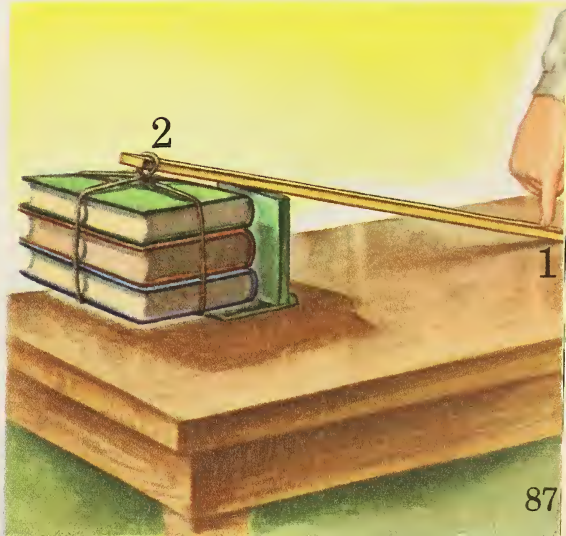
Anything that the bar of a lever rests on is called a fulcrum.



Make a lever and tie some books to End 2 of the bar.

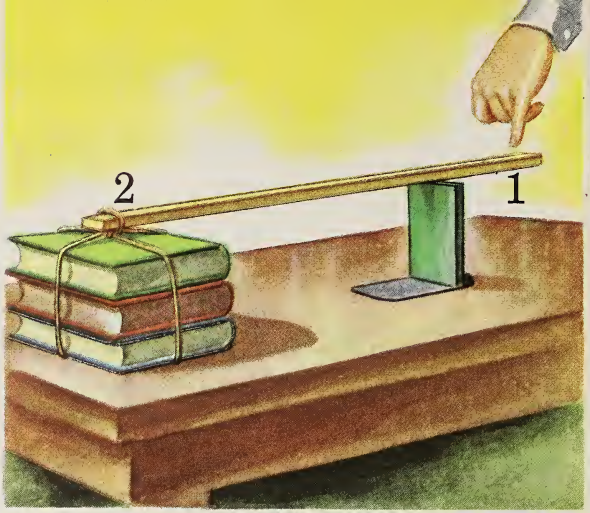
Push down on End 1 with your finger.

Is it easier to lift the load with the help of a lever than without it?



Make a lever and put the fulcrum near End 1.

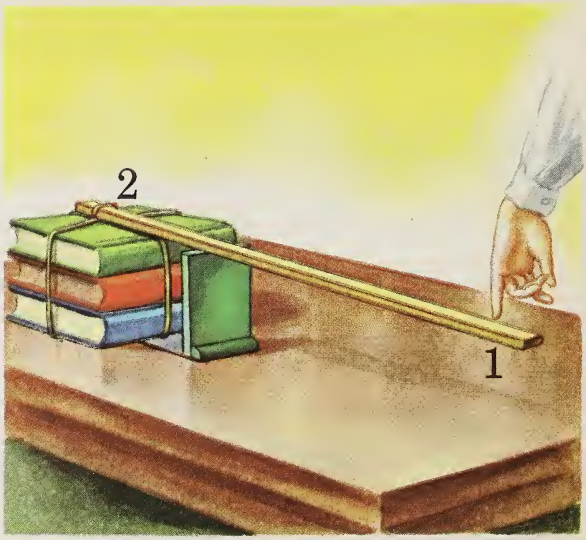
Now see if you can lift the books by pushing on End 1 with your finger.



Place the fulcrum of your lever where you see it here.

Push down on End 1 with one finger.

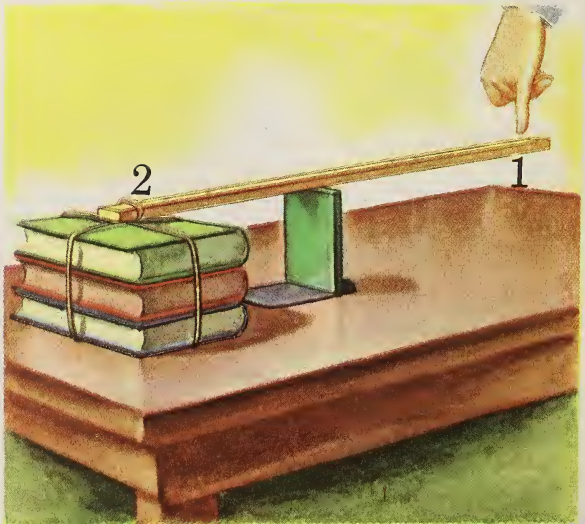
Is it any easier to lift the books than it was?



Place the fulcrum of your lever where this one is.

Now push down on End 1.

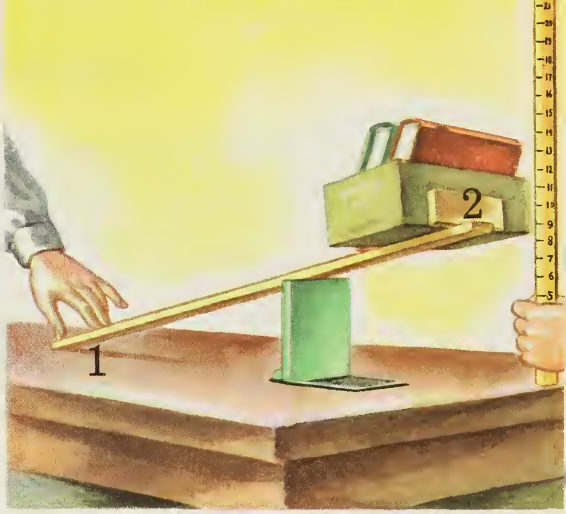
What difference did it make when you moved the fulcrum this time?



See how high the books are being lifted.

Where is the fulcrum?

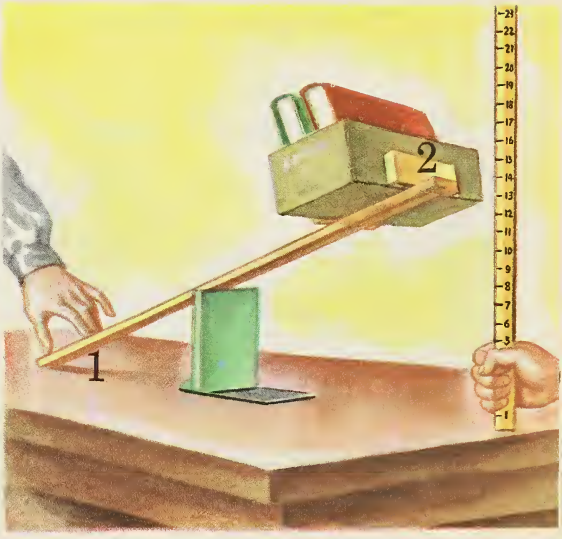
Tell why the load cannot be lifted any higher with this lever.



Where is the fulcrum in this picture?

Is the load being lifted higher than it was in the first picture?

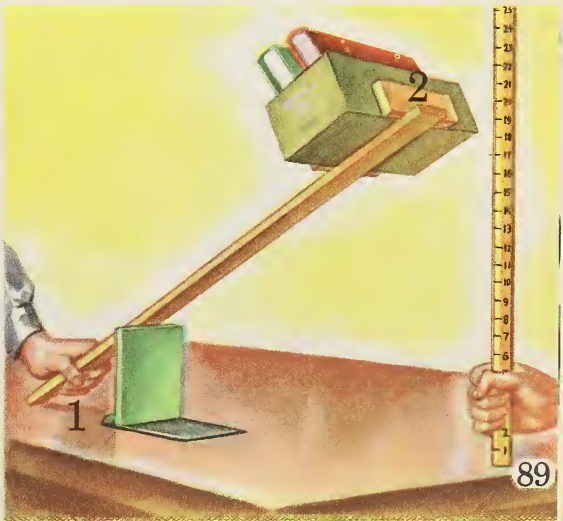
Can the load be lifted higher with this lever?



Where is the fulcrum now?

Is the load higher than it was before?

Try these experiments to see the difference it makes when the fulcrum is moved.



Fun with a Lever

The boys on the seesaw are the same size. Each boy lifts the other.

Up and down they go.

The fulcrum is in the middle.

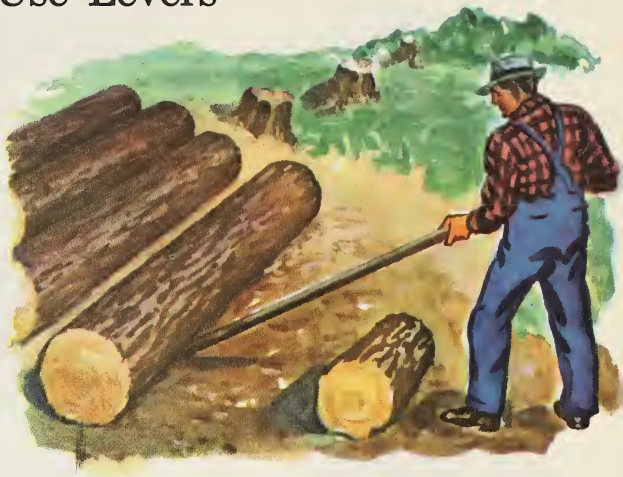
The small boy cannot lift the large one. The seesaw does not work, and the boys are not having fun.

Where is the fulcrum?

The boys changed the seesaw, and now they can go up and down.

How did they change the seesaw?

Tell where you would put the fulcrum to make it easy to lift the log.

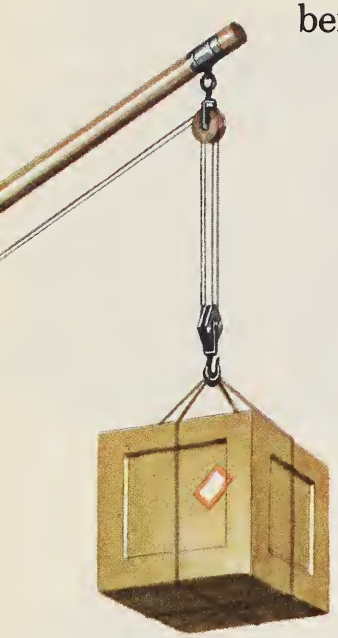


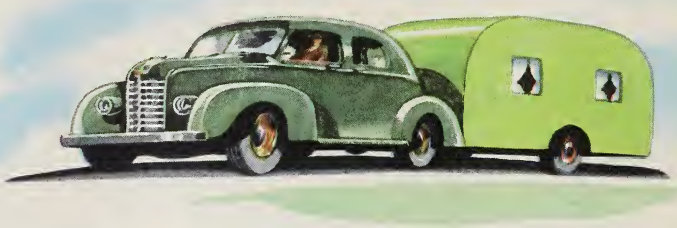
Where would you put the fulcrum so that all the children could seesaw at the same time?

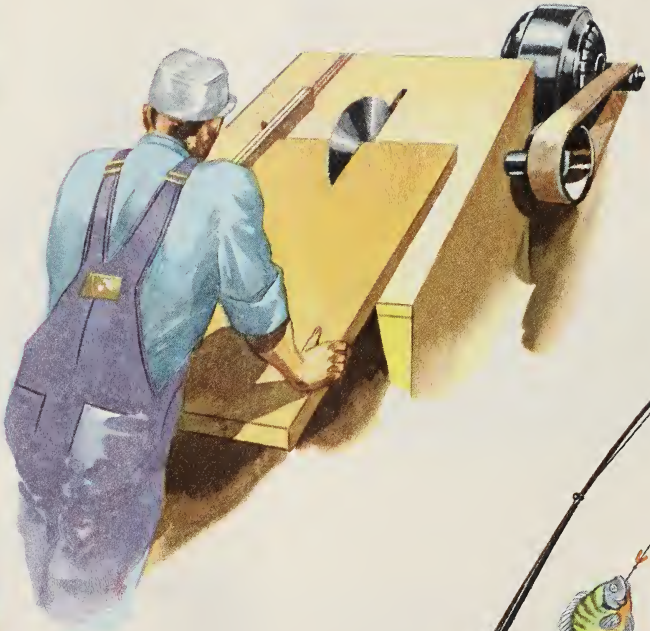
The boys want to put blocks under their house. But they need to lift the house up higher.

Where should they put the fulcrum?

Tell how wheels and levers are being used in these pictures.







Index to Concepts

Pages that promote readiness for a concept are printed in *italics* in the index. Pages that present developmental treatment of a concept are printed in **boldface**. Pages that provide for extension, enrichment, and application of concepts are printed in roman type.

G. Wild-animal life can be conserved by man.
   1. Man can provide shelter in unfavorable weather. PAGE **35**.
   2. Man can provide food in unfavorable weather. PAGES **34-35**, 36.

UNIT II : LAND AND WATER

A. The land areas of the earth's surface vary in physical characteristics.
   1. The raised parts of the earth's surface are called hills and mountains. PAGES *38-39*, **40**, 46-47, 49, 50-51.
      a. Hills vary in size. PAGES **40**, 41, 46-47, 50-51.
      b. Mountains are much higher than hills, and they vary in other physical aspects. PAGES **40**, 46, 49, 50-51.
   2. Lowland areas between hills or mountains are called valleys. PAGES *40*, **41**, 46-47, 49, 50-51.
      a. Valleys vary in size. PAGES **41**, 50-51.
      b. Most large valleys have streams. PAGES *40*, *41*, *47*, **50-51**.
   3. Large, flat areas of land are called plains. PAGES *39*, **42-43**, 50-51.
      a. Plains vary in character according to the region. PAGES **42-43**.
      b. A wide, flat valley can be called a plain. PAGES **50-51**.

B. The water areas of the earth's surface vary in form and size.
   1. Bodies of water that flow across the earth's surface are called streams. PAGES *37*, *38-39*, *40*, *41*, **46-47**, 49, 50-51, 52.
      a. Small streams run together and form rivers. PAGES *46*, **47**, 49, 50-51.
      b. Rivers run into larger bodies of water. PAGES **47**, 50-51, 52.
      c. All streams run downhill, and the steeper the slopes, the faster they run. PAGES *37*, *46-47*, **48-49**, 50-51.
   2. Bodies of water that are surrounded by land are called lakes. PAGES **44**, **45**, 47, 50-51, 52.
      a. Very small lakes are often called ponds. PAGES **44**, 50-51, 52.
      b. Shallow lakes or ponds are often called swamps. PAGES **44**, 50-51.

C. Land and water areas are utilized in various ways.
   1. Land areas produce food. PAGES *39*, *40*, *41*, **42-43**, 46-47, 50-51, 52.
   2. Water areas are a source of food and water supply. PAGES **44**, **45**, 46.
   3. Land and water areas are preserved by man for his use and pleasure. PAGES *37*, **38-39**, 40, 44, 45, 46, 52.

UNIT III : PLANTS

A. Water, sunlight, and certain materials found in soil are necessary for plant development.
   1. Green plants do not stay green if they are deprived of water and sunlight for too long a time. PAGES **58-59**, **61**, **64**, 65, 71, 72.
   2. Plants that have light and water but are deprived of materials in the soil do not complete the life cycle. PAGES **56-57**, 59.

B. Green plants manufacture their food.
   1. Water and sunlight help make and keep plants green, thus helping in food-making. PAGES **61**, 62, 64, 71, 72.
   2. Certain materials in soil are utilized by plants in manufacturing food. PAGES **63**, 72.

C. Plants have definite parts with distinguishing physical characteristics.
   1. The general shape of leaves, their type of serration and veining, and their rib arrangement are identification features. PAGES *53*, *60-61*, *64*, **66-67**, 71.
   2. The general shape of flowers, the number of petals and their arrangement, color, and shape are identification features. PAGES *53*, *57*, *62*, *66-67*, **68-69**, 71.
   3. The size and shape of stems vary according to the kinds of plants. PAGES *61*, *62*, *64*, **66-67**, 68-69, 71.
   4. Root systems vary in type according to the kinds of plants. PAGES *60-61*, *63*, *64*, **66-67**, 68, 71.

D. Plant structures have definite functions in food-making.
   1. Leaves are parts in which food is made. PAGES **61**, 62, 63, 66-67, 71.
   2. Roots take in water and the raw materials needed in food-making. PAGES *56-57*, **62**, **63**, 64, 66-67, 71, 72.
   3. Roots hold plants in the ground. PAGES *61*, **66-67**, 68-69, 71, 72.
   4. Fleshy roots serve as storehouses of plant food. PAGES *64*, **66-67**, 72.
   5. Stems hold leaves up into the light. PAGES *58-59*, **61**, 64, 65, 66-67.
   6. Stems conduct water and raw materials from the roots to the leaves. PAGES **63**, 66-67.
   7. Stems conduct food made in the leaves to other parts of plants. PAGES *63*, **66-67**, 68-69.

E. Plants have definite parts by which they perpetuate themselves.
   1. Flowers produce seeds. PAGES *57*, **68-69**, 71.
   2. Seeds produce new plants. PAGES **56-57**, 58, 60, 65, 68-69, 71.
      a. Seeds contain the embryos of new plants and food which the plants need for their initial growth. PAGES *56-57*, *58*, **60**, **68-69**.
      b. Seeds need moisture in order to germinate. PAGES *56*, **60**.
   3. Bulbs produce new plants. PAGES **68-69**.

F. Plants have enemies that can destroy them or retard their growth.
   1. Some insects can destroy the leaves and stems of plants. PAGES **70**, 72.
   2. Weeds can retard the growth of other plants. PAGES **71**, 72.

G. Plants are protected by man so that he can derive food and pleasure from them.
   1. Man protects food plants, flowers, and trees from enemies. PAGES **71**, **72**.
   2. Man provides favorable growing conditions for plants. PAGES *53*, *54-55*, *56-57*, **58-59**, 61, 62, 64, 65, 71, 72.

UNIT IV : WHEELS AND LEVERS

A. Wheels make work easy.
   1. Wheels have curved or rounded perimeters. PAGES *73*, **74-75**.
      a. All objects having the quality of roundness can roll and may be classified on the basis of different kinds of roundness: spherical, cylindrical, and circular or disk-shaped. PAGES *73*, **74-75**, 76-77, 78-79, 81, 91.
      b. Objects having the quality of roundness are easier to move than objects with flat surfaces only. PAGES *74-75*, **76-77**, 78-79, 81, 92.
   2. Wheels must have axles in order to turn. PAGES *76*, **77**, 78-79, 80, 81, 82, 83, 84, 85, 92-93.
   3. Wheels are operated by various kinds of force—muscle, motor, wind, and moving water. PAGES *76-77*, **78-79**, **80**, 82, 83, 84, 85, 92-93.
   4. Wheels are used in various ways. PAGES *73*, **76-77**, 78-79, **80**, **81**, **82**, 83, **84**, 85, 92-93.
      a. Wheels are used to reduce the force required in the moving of loads from place to place. PAGES **76-77**, 78-79, 81, 92.
      b. Wheels are used to transfer force to other parts of machines by means of axles, belts, or cogs. PAGES *73*, *79*, **81**, **82**, 83, 84, 85, 92-93.
      c. Some wheels help do work by turning round in one place. PAGES *73*, **80**, 82, 83, **84**, 85, 92-93.
      d. The pulley is a kind of wheel that provides a convenient way to exert force in moving objects from one place to another. PAGES **84**, 85, 92-93.

B. Levers make work easy.
   1. Levers reduce the force needed to lift objects. PAGES **86**, **87**, 88, 90, 91, 92-93.
   2. The position of the fulcrum affects the amount of force needed to lift an object and the distance it can be lifted. PAGES *86*, *87*, **88-89**, 90, 91, 92-93.
      a. The nearer the fulcrum is to the weight, the less the force needed to lift the weight. PAGES *87*, **88**, 90, 91, 92-93.
      b. The nearer the fulcrum is to the force, the higher the weight can be lifted. PAGES 89, 91.

3, 4, 5, 6, 7, 8, 9, 63, 62,